

# YOUR computer

November, 1982 \$2.00\* NZ\$3

FOR BUSINESS AND PLEASURE



MAKE WAY FOR  
THE MINI-MICROS

ON TEST: OTRONA'S TINY ATTACHE

MORROW DESIGNS' MICRO-DECISION • JOIN OUR U.S. TOUR • OSBORNE COLUMN • SURPRISE SANYO  
MULTI-USER • THE BUSINESSLIKE APPLE: VERSAFORM AND HOME ACCOUNTANT • MORE POCKET PROGRAMS

ISSN 0725-391

Registered for posting as a publication — Publication number NBP4384

DELTA-HITACHI at STANDS 40 and 42

CORDIALLY EXTENDS TO YOU A COMPLIMENTARY

# INVITATION



TO AUSTRALIA'S LARGEST ANNUAL COMPUTER EXHIBITION

**DATA 82**

MELBOURNE SHOWGROUND  
9th-11th NOVEMBER 1982



**DELTA**



**HITACHI**

*proudly offers Australia . . .*

a rare opportunity to pick up a  
Super-Saver Peach System at  
special DATA '82 prices.

From the Hobbyist to the Full  
Business User — **DELTA** has a.  
Super-Saver Peach System for  
you . . .

See **DELTA**

at Stands 40 & 42 at DATA '82 or  
Phone **DELTA** — (03) 62 2008

(02) 922 1608

for details of participating dealers.

# inside your computer

Vol 2, No 5.  
November 1982.

## Special

9

### Take A Trip!

Your last chance to join Bill Bolton on *Your Computer's* tour of the USA, and visit one of the micro industry's most important ever happenings — CP/M '83.

## news

6

### Your Computer News

Our roundup of the latest in software and hardware, new and upcoming releases and happenings in the world of microcomputers.

48

### Sanyo's Solution

A new multi-tasking software package, launched this month, has turned a low-cost Sanyo into a powerful business proposition.

## features

21

### Mini-Micros Move In

More campaigners join the Osborne trail... Morrow with a non-portable baby which offers most of the features of big CP/M machines in a stunning value-for-money package, and Otronix with the smallest, but most powerful, portable we've seen so far.

52

### Be A Winner!

If you're into Commodore VICs, or would like to be, this is the place to start. This is your last chance to win \$1100-plus worth of expansion add-ons to boost the VIC's power.

53

### Pocket Programs

Just a teaser compared to the special bonus section to be added to next issue, but these pocket programs should keep you going in the meantime.

60

### Up-Dating dBase II

If you can't stand American date formats, this patch for dBase II might be just what you've been looking for...

73

### Home Accountant

The salesmen were right all along — you really can do your home accounting on a micro-computer, and do it well with a package as sophisticated as this.

76

### Apple Disk Peeker

Steve Zanker shows you how to get into those mysterious Apple disks — presenting a useful program for any Apple owner.

## business

28

### VERSAtile Forms

Peter Sandys gives us the good news on a deservedly popular new addition to the range of business programs for the Apple, Versaform.

40

### The Speedy Sandy's

Australian-written Sandy's word processor undergoes its most important update yet — the addition of the author's FastDOS to the package is a dramatic improvement.

## For beginners

30

### BASIC For Birdwatchers

Les Bell's tutorial looks at some of Microsoft BASIC's more useful functions in the area of string handling, and begins to delve into the world of PEEKs and POKEs.

44

### Understanding Assembler

Now we've figured out those assembly routines, let's put them to

use in this experiment — writing a monitor for your system.

70

### Your Computer Clinic

Where we set out to solve readers' problems, and try not to create more for them in the process...

94

### Glossary

Our guide to the beginner's foreign language — computer jargon.



The Otronix 512 (known overseas as the Attache) might be called the Rolls-Royce of portable computers, except that in this volatile industry it's just as likely to be upstaged next month! See it on page 24.

## reviews

21

### Decisions, Decisions

Morrow Designs' Micro Decision is one of the stars in the latest 'all-in package' war. Total price is less than the value of the software, and all you have to do is add a terminal.

24

### Otronix 512

The most sophisticated of the new portables, the Otronix does almost everything as well as a 'mainframe' CP/M machine.

CPM '83

Your last chance! Join YC columnist Bill Bolton on our tour to the USA for one of the most important events in the microcomputer calendar, CPM '83. We leave in January, so there's NO time to waste...

## departments

36

### Text File

Your words, our pages...

78-96

### Popular Systems

Individual columns devoted to the popular systems, including a new column for Osborne users as well as our latest additions, the MicroBee and the Hitachi Peach.

98

### Readers' Services

Want to contribute a story, write a program, ask a question, subscribe, sue us or...? Read this first.

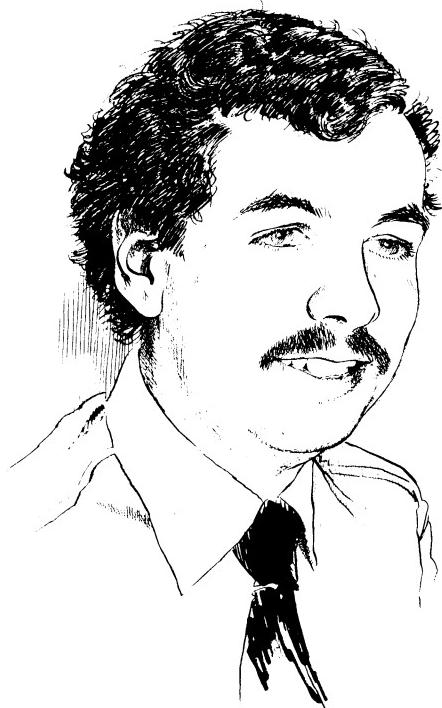
## next month

Watch for our bonus liftout section of pocket programs, around 16 pages worth on top of the usual size of the magazine. If you like the idea, let us know — we might be able to talk the accountants into letting us have it as a semi-regular feature.

Speaking of semi-regular, we must apologise for the non-appearance this issue of part two of our new series, *Introduction To Logic*.

Staff disappearances (actually, illness) caused us quite a few time problems last month, but things are back on the tracks now...we hope. Logic will return in the December issue.

# editorial



*EVERY NOW and again I drag out the old crystal ball and have a go at predicting the future — which in a high-technology area like computers is extremely foolhardy. Nonetheless, it's fun to make predictions and later see how far out one was.*

*In this issue, I've reviewed the Hewlett-Packard HP-41 pocket calculator, and some of its features set me to thinking. I've become a heavy user of*

*several of the features in its extension modules — notably the alarm features and the ability to store simple lists in extended memory.*

*This is a major area for personal computer manufacturers to explore. The ability to schedule a month's appointments ahead of time, to check for time conflicts, to store lists of things to do has always been theoretically possible on personal computers. However it has not come to fruition because of two problems.*

*First, most computers do not have a real-time clock, particularly one that continues to keep time when the computer is switched off. Without any knowledge of correct time, a computer would make a lousy secretary!*

*Second, most computers are not portable. A lot of appointment scheduling or reminder entry is done outside working hours, when the phone is not ringing, there are no interruptions and you can get peace and quiet to plan properly. To be available at all times, a computer must be portable.*

*Perhaps what is needed is not a computer, but just a very sophisticated form of alarm watch with an alphanumeric display. However, the added feature of running programs adds so much functionality for so little cost that it would seem pointless to restrict such a gadget to time-keeping.*

*Who will be the first manufacturer to put together a really good suite of programs for time planning functions? There's a potentially huge market out there, and so far it seems only Hewlett-Packard has caught on!* □

**Editor:** Les Bell  
**Art Director:** Michelle Mabbott  
**Advertising Manager:** David McDowell  
**Managing Editor:** Matt Whelan  
**Office Services:** Joy Quinn

**CONTRIBUTORS: Australia** — Brendan Akhurst, Shane Andersen, Dr John Barrett, John Batty, Bill Bolton, Paul Beaver, David Brudenall, Geoff Cohen, Errol The Cat, Frank Linton-Simpkins, Bref Ruhl, Peter Sandys, R G Stevenson, Greg Stringer, Keith Stewar., Fred Symes, Leon Yendor. **New Zealand** — Peter Isaac. **UK** — Peter Docherty. **United States** — Daniel Montague. US news items via The Source, from Hamsource public files created by Dwight Ernest (TCU366, New York) and W5YI, Fred Maia.

YOUR COMPUTER is published monthly by Eastern Suburbs Newspapers, under licence from Motor Word Pty. Ltd. Printed by ESN — The Litho Centre, Waterloo, NSW. OFFICES: Editorial and Advertising, 140 Joynton Ave, Waterloo, NSW. Phone (02) 662-8888. Postal Address: PO Box 21, Waterloo 2017. PUBLISHER: Michael Hannan. Typeset by Hughes Phototype, Cremorne, NSW (02) 90-4034. Distributed nationally by Gordon & Gotch. Registered for posting as a publication — Publication number NBP 4384. See page 98 for information on copyright, contributions, reader services and subscriptions. \*Recommended and maximum price only. ISSN 0725-3931. **Source Mail:** Les Bell TCY314; Matt Whelan TCY267.

# Merry Christmas!

City Personal Computers wishes all its customers a very Merry Christmas and a Happy New Year, with the greatest range of computers, accessories and software!

**Star Printer**

The best low cost printer available. 80 c.p.s. with bi-directional printing. Friction and tractor standard. Centronics parallel interface. \$595

**THE COMMODORE VIC-20 COLOUR COMPUTER**

The Commodore VIC-20 is the best value available and we have Sydney's widest range of software and accessories for it.

|                                |          |
|--------------------------------|----------|
| VIC-20 Computer                | \$399.00 |
| Arfon VIC expander             | \$249.50 |
| 16K Expansion cartridge        | \$129    |
| Super Expander Hi-Res graphics | \$69.00  |

**PLUS LOTS OF SOFTWARE**

**APPLE SOFTWARE**

We sell far more software than can be listed here — over 400 titles! The selection below should wet your appetite, but come in to see the whole range.

| ACTION GRAPHICS        | ADVENTURE |                          |          |
|------------------------|-----------|--------------------------|----------|
| SERPENTINE             | \$46.50   | WIZARDRY                 | \$68.95  |
| CANNONBALL BLITZ       | \$47.95   | ULTIMA                   | \$55.50  |
| ALIEN AMBUSH           | \$32.95   | ULTIMA II                | \$71.95  |
| CHOPLIFTER             | \$41.95   | ESCAPE FROM RUNGISTAN    | \$34.50  |
| STARBLAZER             | \$38.95   | DEADLINE (NEW!!)         | \$63.95  |
| HORIZON V              | \$40.50   | TIME ZONE                | \$124.00 |
| FROGGER                | \$42.95   | (6 double sided disks!!) |          |
| DAVID'S MIDNIGHT MAGIC | \$41.95   | KABUL SPY                | \$40.50  |

**OSBORNE**

**THE PORTABLE COMPUTER**

We are THE Osborne experts and have the complete range of hardware and software. Here are a few examples:

|                      |        |
|----------------------|--------|
| Cardbox Database     | \$290  |
| Microlink Comm.      | \$129  |
| Datastar             | \$360  |
| Supersort            | \$365  |
| Bstam Comm.          | \$290  |
| Dbase II Database    | \$895  |
| 5 Megabyte Hard Disk | \$3950 |

**APPLE CARDS**

Get more out of your Apple with these quality expansion cards:

|                                       |       |                               |       |
|---------------------------------------|-------|-------------------------------|-------|
| DIGITEK COLOUR CARD WITH RF MODULATOR | \$235 | SATURN 64K RAM CARD           | \$595 |
| MICROSOFT Z80 CARD WITH CP/M          | \$449 | SATURN 128K RAM CARD          | \$850 |
| T.K.C. JOYSTICK                       | \$74  | MICROBUFFER PRINTER CARD, 16K | \$385 |

**VISICALC**

Still the most widely-used business program and now with many expansion options:

|                                 |          |
|---------------------------------|----------|
| VISICALC 3.3                    | \$385.00 |
| V.C. EXPAND (for RAM cards)     | \$134.00 |
| VISIBLEND (Consolidated models) | \$64.95  |

**STOP PRESS — STOP PRESS**

**80 COLUMN VISICALC**

Yes! Now you can use your Vision 80 Card to give 80 column work sheet.

|                            |         |
|----------------------------|---------|
| VISICALC 80 COLUMN UTILITY | \$79.00 |
|----------------------------|---------|

**MICROSOFT MULTIPPLAN**

New Generation spreadsheet program. Features 80 column display as standard, multi-sheet consolidation and lots lots more!! For Apple II, Osborne and CP/M formats

|       |
|-------|
| \$365 |
|-------|

**apple computer**  
Authorized Dealer

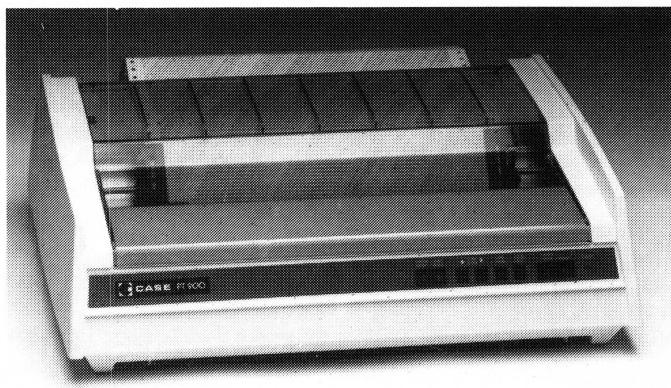
75 CASTLEREAGH STREET  
SYDNEY  
233 8992

**OSBORNE**

5/385 PACIFIC HIGHWAY  
CROWS NEST  
922 3600

**CITY PERSONAL COMPUTERS** 

# your computer news



## Quiet Performers

TWO NEW matrix printers claimed to combine high performance and quality with a 'remarkably low' operating noise level have been released by Case Communication Systems.

Called the PT 900 Series, the new models are positioned at the top of the line of Case's range of matrix printers.

As well as high speed printing in normal mode, the printers incorporate a correspondence quality print feature giving clear, crisp character printing. The series also features high resolution dot addressable graphics.

Capable of character printing speeds from 200 to 340 characters a second, the PT Series has automatic high speed head positioning (logic seeking) enabling throughput printing rates of up to 300 lines a minute in draft mode.

In correspondence quality mode, 'near letter-quality' text is produced at speeds of up to 80 characters a second.

The raster scan graphics capability provides a resolution of 144 by 144 dots a square inch at a print speed of up to 4000 dots a second.

Standard features include downloadable alternate character set, eight character sizes with double widths, four selectable line spacings, super and sub-script printing plus auto underlining.

For further information contact Case Communic-

ation Systems on (02) 438 2400. □

## Apple Education

APPLE has announced a special education opportunity offer for primary schools designed to assist them in providing hands-on experience to students at an early stage.

The special offer includes a 64K Apple II computer and disk drive, PAL colour card and a complete set of Apple Logo software all for less than half the normal cost price.

Announcing the offer, David Strong, general manager for Apple in Australia said Apple has always been committed to providing computer experience to children at an early age. □

## Computer Guidance Seminars

COMPUTER guidance seminars to be held in conjunction with the Data '82 Computer Exhibition at Melbourne Showground this month will cover a range of subjects of vital interest to businessmen concerned about productivity.

The Seminars, in the form of easy-to-understand briefings, will cover such subjects as selecting the right computer system, robotics, computer aided design and the automated office.

They will be held during the

day on November 9, 10 and 11 — the Data '82 exhibition dates — with sufficient time set aside to review over 130 stands displaying the latest in business computers.

The broad topic headings for each of those dates are respectively: Choosing The Right Computer System; Computers in Manufacturing, and The Automated Office.

"The major emphasis in all the seminar sessions is to provide practical, down-to-earth commentary on current and future applications of computers in the business environment," said Kevin Rebbechi, managing director of Graphic Directions, the exhibition organiser.

Victorian Premier John Cain had this to say on Data '82:

"Today, children in our primary and secondary schools are taught to use and understand a technology which is often to their parents a complete mystery."

Computer technology, it has been suggested, will have an even greater impact on the daily lives of ordinary people than the industrial revolution of the last century.

Many people have expressed apprehension at this prospect; some see computers as a threat to livelihoods, as a potential invader of privacy. Others see them as a tool to increase productivity and to release people from mundane, repetitive work, creating more time for leisure activities.

Which scenario eventually prevails depends on how wisely we use the new technology. This will be human decisions.

Whatever one's view of the future role of computers in society, there is a need to inform and educate people. If we do not understand computers fully, we risk making the wrong decisions.

Data '82 offers an opportunity for the industry to be involved in the process of

community education and understanding. I am delighted that the exhibition and seminars have attracted such wide interest.

Victoria leads Australia in general instrument application and the manufacture of robotics. We have a significant position in the fields of computer manufacture and assembly, and in microprocessor applications.

On behalf of all Victorians, I welcome visitors from interstate and overseas to this important exhibition and the seminars. I am confident that the people who take part will leave with a greater understanding of computers and computer technology, and an insight into the ways the technology can be used for the benefit of society as a whole." □

## Computerised Real Estate

THERE is now a complete property management system designed specifically for the Australian real estate agent.

Called The Real Estate Agent the system is written for the Apple II computer which is widely available across the country.

The Real Estate Agent computerises the ledger card system of property management by holding all required information in electronic files.

Once filed the data is instantly accessible, can be altered easily and can be combined to produce analysis reports quickly and efficiently.

For further information contact Vicki Staveacre or Lee McLean at Burson-Marsteller on telephone (02) 241 3016. □

## TRS-80 Software

MOLYMERIX has established a mail-order network, aimed at TRS80 and System 80 users, with outlets in Gosford and Auckland.

The company says it will

market 'consumer-orientated' software at prices which are within easy reach of the hobbyist and small business user. Its catalogue is being marketed as a reference tool, with extensive descriptions and screen photos accompanying many of the products. Regular updates of the catalogue will be mailed to subscribers as new software is released.

Readers will be able to choose between a wide range of programming utilities, arcade and adventure games, data management systems, disk operating systems, education and communications software. For business users, there will be a number of small accounts packages, stock control, time recording, word processing and mailing systems.

The Molymerx Software

Catalogue is to be released in late November, available through mail-order for \$2 (NZ\$3). For further information contact Molymerx by phoning (043) 69 4888, or writing to PO Box 900, Gosford, 2250. New Zealand readers should phone (817) 4372, or write to PO Box 60152, Auckland. □

### Tandy Support

ARPAGE Business Software is a new company established with the expressed aim of providing information, advice, custom software, and consumables for the Tandy TRS-80 Model I and Model III and the Dick Smith System-80 microcomputers.

At present, the company claims it has "the best and fastest Accounts Receivable

system available for this range of computers".

The system has been designed for use with the absolute minimum of operator training as all procedures are fluently prompted. It prints invoices, provides a sales analysis of up to 800 production lines, keeps separate balances for certificate quote, taxed items, tax charge, and freight costs, and provides six separate printed reports on the current financial standing of the company. The reports may be printed as often as is required and at any time during the month and they will be correct to the last transaction entered.

It also has a small Taxi fleet management system that provides detailed information on as many as twenty separate repair cost/failure items.

It will highlight running costs, driver performance, off road costs, and kilometres travelled for either one cab or all cabs which could save a fleet manager hundreds of dollars per month.

Accounts Payable and General Ledger systems are undergoing final testing and should be ready for installation in mid November. These two systems fully integrate with the Accounts Receivable system. The General Ledger system requires very little data entry by an operator as it uses the data files developed by the Accounts Receivable/Payable systems.

Arpage Business Software can be contacted at PO Box 386, Gladesville, 2111 or by phoning (02) 816 2471. □



|   |        |
|---|--------|
| ATARI 400 .....                                     | \$499  |
| ATARI 800 .....                                     | \$1149 |
| ATARI 410 Recorder .....                            | \$136  |
| ATARI 810 Disk drive .....                          | \$769  |
| 32K Ram Cram .....                                  | \$179  |
| Joysticks per pair .....                            | \$32   |
| Asteroids .....                                     | \$53   |
| Missile Command .....                               | \$53   |
| Space Invaders .....                                | \$53   |
| Pac Man .....                                       | \$65   |
| Star Raiders .....                                  | \$65   |
| ATARI Basic including manuals .....                 | \$120  |
| Invitation to programming 1 .....                   | \$40   |
| 2.....  | \$45   |
| 3.....  | \$45   |
| Languages: French, German<br>Spanish, Italian ..... | \$79   |

- These prices are current at time of going to publication and could be subject to further change.
  - Payment by Bankcard, cheque (allow 5 days for clearance) or money order.
  - Allow two weeks for delivery from date of order.
  - These products were all in stock at time of publication. No responsibility is taken for late delivery due to suppliers being out of stock.
  - Money back guarantee on all hardware and unopened software if not satisfied.
  - ALL PRICES INCLUDE TAX.
- FREIGHT CHARGES  
Under 5kg add \$5.00 5kg to 10kg add \$7.50.

**COMPUTER DISOUNTERS**  
P.O. BOX 309, BONDI JUNCTION 2022  
N.S.W. PHONE: (02) 232 7704



**OSBORNE 1™**

Normally \$2595 Our price \$1895

THIS MONTH'S SPECIAL



VIC 20 \$339

|  |       |
|--|-------|
| 1540 Disk drive .....  | \$599 |
| VIC Datasette .....  | \$84  |
| VIC 1515 Graphics printer .....  | \$399 |
| VIC 1010 Expansion module .....  | \$169 |
| VIC Games cartridges. ea.....  | \$31  |
| (VIC Avengers, Star Battle, Road Race, Omega Race, Super Alien, Jelly Monsters.) |       |
| VIC 16K Memory expansion....   | \$110 |
| VIC Recreation pack of 6 games   | \$52  |
| VIC Household calculation pack of 6 .....  | \$52  |
| <b>PLUS</b> all VIC-SOFT games available   |       |
| \$12 each, and new educational series  |       |
| write or call.   |       |

Enclose list of goods required.  
Write or call for our free catalogue.

Name:.....

Address:..... Post Code:.....

Signature:.....

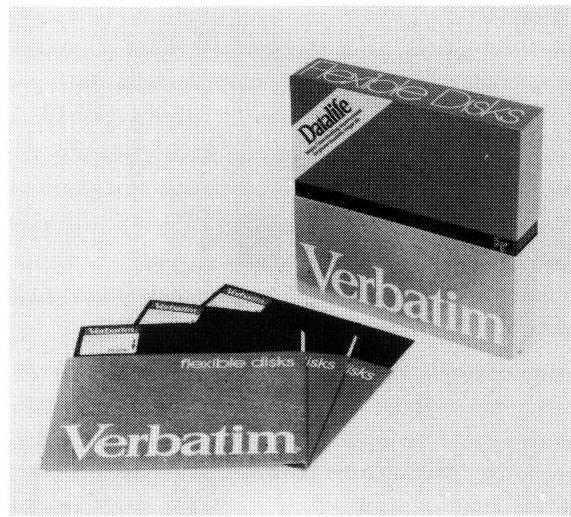
Expiry date:.....

Bankcard No:.....

|  |  |  |  |  |  |  |  |
|--|--|--|--|--|--|--|--|
|  |  |  |  |  |  |  |  |
|--|--|--|--|--|--|--|--|

YC17

# Try new Verbatim Datalife™ disks for the performance of a lifetime



Verbatim is committed to offering customers the very best removable magnetic storage media. Our line of highest quality magnetic storage products extends to virtually all removable media forms and includes Datalife™ flexible disks and minidisks, data cartridges, data cassettes and Datalife™ head cleaning diskettes. Verbatim is intent on keeping their products at the forefront of technology, going above industry standards, setting a new standard for excellence.



**magmedia**

MAGMEDIA SERVICE PUTS THE CUSTOMER FIRST

|                           |                           |                            |
|---------------------------|---------------------------|----------------------------|
| SYDNEY<br>(02) 428 1100   | BRISBANE<br>(07) 229 1600 | MELBOURNE<br>(03) 699 9688 |
| CANBERRA<br>(062) 48 6751 | HOBART<br>(002) 34 4522   | PERTH<br>(09) 328 3311     |

## President Goes Columbia

PRESIDENT Office Machines, erstwhile Osborne distributor and currently handling the Kaypro II, has announced it will release the Columbia MPC (Multi-user Personal Computer) at the Data 82 Exhibition in Melbourne on November 9.

While the Columbia looks quite similar to the IBM PC, and is in fact claimed to be both hardware and software compatible with it, 'that's where the similarity stops,' says Tom Cooper, managing director of President.

The Columbia comes with standard features that are options on the IBM machine, such as 128 Kbytes of RAM, two RS-232C ports, floppy and Winchester disk controllers, DMA and interrupt controllers.

In addition, the Columbia has eight expansion slots — three more than on the IBM PC — while the disk drives have a capacity of 320 Kbytes each, more than double the IBM PC, but will read IBM format disks.

Amongst the Columbia-supplied options are a Z-80 processor card, a 256 Kbyte RAM card and integral Winchester disk. Two operating systems are available: MS-DOS and CP/M-86. MP/M-86 and Oasis 16 operating systems will be available by the end of the year, and Xenix (Microsoft's version of Unix) will be introduced in early 1983.

President has also announced new software to be supplied as standard with the Kaypro computer. The Perfect word processor offers such advanced features as automatic footnoting and indexing, as well as full editing and formatting facilities including proportional spacing.

Perfect Speller is a matching spelling checker with 50,000 word dictionary, while Perfect Filer is a records management system suit-

able for maintenance of mailing lists and information databases.

Perfect Calc is an electronic spreadsheet calculator which allows up to seven sheets in memory at the same time with two separate sheets sharing the screen.

Also supplied with the system is a selection of personal finance programs, small business programs (including accounts receivable and payable) and investment analysis programs.

The software is also available to previous purchasers of the Kaypro — contact President for further details. □

## Advantage Renter

MAJOR Australian computer company Anderson Digital Equipment has introduced a new microcomputer rental plan in which the client deals direct with ADE and not a finance company.

The scheme also includes an extensive maintenance plan, and a 'rental pay-back buyer option clause'. And to kick off the scheme, ADE is launching it in a special package deal, involving a NorthStar Advantage microcomputer with dual floppy disks, and OKI Microline 84 dot matrix printer, Microplan and WordStar software packages, plus CP/M.

Under the scheme, purchasers can rent equipment for a minimum of one year. The normal rental period is three years and includes capital city maintenance on all equipment.

Under the buying option clause, a purchaser can, at any given time, exercise an option to buy the equipment outright, in which case one third of his rental payments can be used as deposit on the same equipment.

For further information contact Anderson Digital Equipment at 14 Whiteside Road, Clayton 3168. Phone (03) 544 3444. □

Your  
Last Chance!

# VISIT The CP/M Event Of The Year

Join Your Computer's Tour To:



**CP/M '83 is:** The biggest-ever assembly of CP/M-related hardware, software and people. Organised by Digital Research, and presided over by the man who wrote CP/M, Gary Kildall, this conference and show will be entirely devoted to the furthering of CP/M development and value to the user. You'll be able to find out anything you've ever wanted to know about CP/M, and see all the new releases and upcoming advances.

**CP/M '83 is:** A vitally important — and interesting — event for anyone involved in CP/M. It will be of particular benefit to dealers and salesmen who have found themselves thrown in at the deep end with the recent upsurge in CP/M implementations.

**CP/M '83 is:** A tax-deductible business trip for those who make their living out of microcomputers, as is the Study Tour we will conduct, for those interested, after the 'Main Event'.

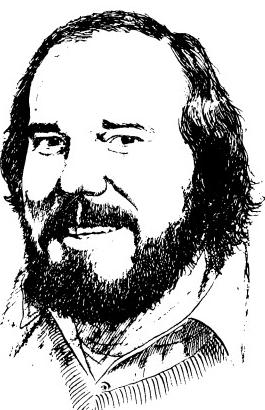
**CP/M '83 is:** On soon, so you have to act NOW! We'll be leaving for San Francisco around January 18.

**TOUR PRICE  
\$1550\***

Join one of Australia's most informed CP/M'ers, YC columnist Bill Bolton, who will lead the tour, conduct an in-depth post-conference debriefing, and take those interested on a further industry study tour, visiting such places as the Osborne factory and Digital Research itself.

#### PLUS:

This is no follow-the-leader, never-stray trip. You'll have to leave Australia on the same flight, but after that your time is your own if you choose to leave the group. Return flights are entirely optional — you can go your own way, or select one of our alternatives: The study tour; a break in Hawaii; or a family trip to Disneyland!



*For further details, cut out this coupon (or copy it) and return it as soon as possible to:*

**Your Computer CP/M '83 Tour**  
PO Box 21 WATERLOO 2017

or phone Joy Quinn on (02) 662-8888.

\* **YES, please, tell me more!** I want to keep right up with what's happening in the microcomputer world, so send me the details of:

- Conference>Show Tour:** For those who want to be out and back within a week — or do their own thing after the show — the basic trip outline.
- Show and Study Tour:** We're in the process of arranging visits to Osborne, Digital Research, Silicon Valley (of course!), and others. This, too, will be tax deductible for the business tripper.
- Business and Pleasure:** Wind down — and be the envy of your friends — with a spell in Hawaii on the way home.
- Family Fun Tour:** Take the family along (they'll have plenty to do in the short time you're at the show), and afterwards head off to Disneyland. A week in Hawaii on the way home wouldn't lose you any points, either...

Name: .....

Company: .....

Address: .....

.....

Postcode: ..... Phone: .....

\* Basic price ex-Sydney, includes return air fare and accommodation in the Sheraton Palace, a first-class hotel just a few blocks from the exhibition centre. Optional extensions to the tour will be at extra cost, to be advised in the detailed information we will forward to those who send in the accompanying coupon.

**THE DIFFERENCE IS –  
OUR PRODUCTS WORK!!**

## **ILEHEAD Pty Ltd**

P.O Box 215, Forestville 2087

Phone: (02) 452 4435

MAIL ORDER AND WHOLESALE ONLY

Proudly announce

PCG-80 SUPA-HI-RES BOARD \$179.00

The first fully software supported high resolution modification for TRS-80 & SYSTEM 80 microcomputers.

- World-first!!
- 256 programmable characters plus dot-addressability on one board!
- Mix-n-match L0-res, hi-res & alphanumerics on screen!
- Totally designed & manufactured in Australia, not a shoddy copy of an overseas modification.
- No external wires or boxes. Fully contained in keyboard.
- Uses no mainline memory – therefore no possible conflict with any existing software.
- Plot any mathematical function in SUPA-HI-RES mode.
- Sine waves, circles etc in continuous fine-line graphics, and mix with "chunky" graphics and alpha-numerics on screen.
- 384 x 192 addressable pixels.

PLUS – for the first time

### **TOTAL SOFTWARE SUPPORT!**

SUPA HI-RES GAMES \$19.95

SUPA HI-RES CHESS

CATA COMBS

KRAZY KONG

SPACE-SHOOTOUT

CENTIPEDE ATTACK

GHOST HUNTER

all on easy-load cassette

### UTILITY SOFTWARE PACK \$49.95

Includes: Editor  
Loader  
Sample data files  
S "script" font  
Foreign language fonts  
(Ethnic word-processing now possible)  
Inverse alphanumerics  
HEX numbers

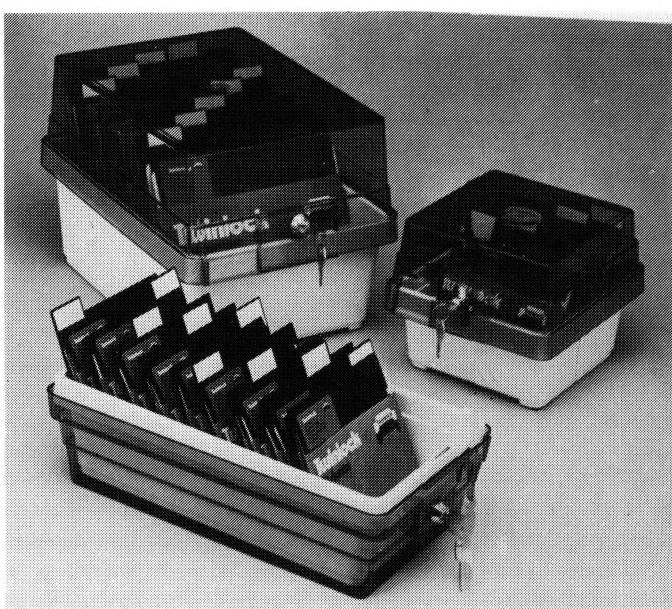
SUPA-HI-RES BASIC fully documented for the serious Enthusiast/Professional Programmer \$49.95

Adds 16 HI-RES functions to any disk system automatically, links with any version of disk BASIC.

Adds HPLOT, HSAVE, HLOAD, HCOPY (print hard copy), VERSION, HELP "filename", PMODE, DMODE, LO RES, PROGRAM, HBLOCK, HINIT, HON, HREL, HXNT, PI (double precision) to any version of DISK BASIC

Model I, Model III & system 80 versions now available  
Please add \$3.00 P. & P.

**your computer needs • your computer n**



### **Lockable Floppy Trays**

TWINLOCK has introduced a range of lockable plastic trays for the storage of both 13 and 20cm diskettes, or floppy disks.

There are four trays in the range, with 45 and 90 diskette capacity for both sizes of floppy disk. Produced in high impact ABS Plastic with a smoked perspex lid, the trays are lockable and are supplied complete with divider plates and self-adhesive title strips for indexing.

Prices range from \$32.72 for a storage tray for 45 13cm floppy disks, and from \$46.96 for 45 20cm floppy disk capacity tray.

For further information contact Mr T G Johnson on (03) 584 4000. □

a variety of projects and discussion groups and enable them to greatly improve their skills in these areas.

Membership of the club will not be restricted to students of the College. The only requirement would be a contribution of \$10 to Student Amenities. This means that on completion of their courses students can continue their association with the club, if they wish, as well as providing an opportunity for local residents in the St George region who have a desire to learn more about microcomputers and their applications in either business, education or the personal computer hobbyist areas, to do so.

The nature of the activities undertaken will depend on the interests of the club members and their respective skills at the time.

A number of teachers and students have already expressed an enthusiasm for this idea. They have a variety of backgrounds which include Business and Administrative Studies, Building, Electrical Engineering, Electrical Trades, and General Studies.

Anyone wishing to join the club, or learn more about it, can contact Jim Forrester, Senior Head Teacher,

**Continued on page 14**

School of Business and Administrative Studies, St George College of TAFE, Cnr Princes Highway and President Ave, Kogarah, 2217. Alternatively, phone (02) 587 1333. □

### Vector Goes Faster

NOT A reference to clock speed — Dicker Data Projects, agent for Vector Graphic computers, is sponsoring Phillip Revell's 'Formula 1' (Australian version) racing car. Revell, who has a string of Formula Ford successes behind him, is Australia's youngest Formula 1 driver.

Using a Vector computer to analyse suspension geometries and roll centres, Revell hopes to be able to prepare his Ralt RT4 car more quickly and more accurately.

But the Dicker Data involvement goes beyond just sponsorship. Both David and Fiona Dicker are helping set up the car and are part of the pit crew on race days. □

### A Little Learning

TWO COURSES being run in the Canberra area will probably be of interest to our readers.

'Microcomputers in Business and Administration' is being held on November 19 and is oriented towards end users with a need for stand-alone computing facilities as well as DP managers trying to figure out what micros are all about.

The comprehensive syllabus covers just about everything one could want to know about micros, and every participant will receive a floppy disk with the complete source code of an accounting system comprising general ledger, debtors and creditors.

The other seminar, on CP/M and its derivatives, will cover CP/M-80, CP/M-86, MP/M, MP/M-86, Concurrent CP/M-86 and CP/M-68K. The disk in this case will contain a sample CBOS

source file for a machine with both 20 and 13cm disk drives. Practically everything you wanted to know about CP/M but were afraid to ask should be covered in this seminar.

The course instructor in both cases is Peter Harris, foundation convenor of MICSIG and president of the CP/M User's Group of Australia.

The seminars are being organised by The Office Technology Training Centre, 2 Chauvel Circle, Chapman ACT 2611, but as time is moving on, we'd suggest you ring Ms Maureen Greer on (062) 31 0415. □

### Handy Utilities

THERE ARE times when you have to perform some boring repetitive task, and know that you could easily program the machine to do it, but just don't have the time.

CBASIC programmers in particular often encounter such tasks as stripping out unreferenced line numbers or recompiling a program because a new module is bigger than the main module and the %CHAIN statement will not work correctly.

A new series of utilities from Asamer Holdings is designed to eliminate some of these problems. TRIM.COM, for example, will delete those line numbers which are not the targets of a GOTO, GOSUB and so on. This makes the source code of a CBASIC program converted from MBASIC much more readable.

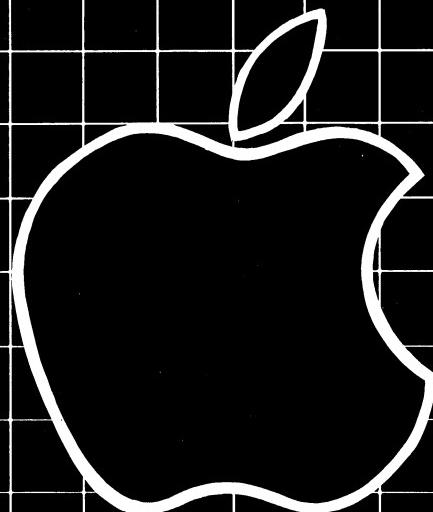
RENUM.COM will renumber any BASIC program (although MBASIC programs must have been saved with the .A option). Limits for renumbering can be specified, as can the new starting line number and increment.

READ.COM displays a CBASIC source file with line numbers; the best point is it handles %INCLUDE directives correctly, showing the

# WHO PUT THE EXTRA BYTE INTO APPLE ] [

PLUS

## VISICALC WORDPROCESSING AND COMMUNICATIONS



## MAGAZINE REVIEWS RATED IT No. 1

- **CALL A.P.P.L.E.**  
**"By far the best"**
- **SOFTALK**  
**"This is the only board to buy, it will be tough to beat"**
- **YOUR COMPUTER SEPT. '81**  
**"An Australian winner"**
- **BYTE**  
**"Most impressed by the many things it does"**

included file. This allows faster compilations, with the file only being examined for the lines in error. PRINT.COM sends a file to the printer with proper pagination and line numbering.

CPRINT performs a similar function, but prints a CBASIC or CB-80 source file in exactly the same format as the compiler. It also recognises %LIST and %NOLIST instructions and takes the same action as the compiler, and includes %INCLUDED files.

My favourite is SIZE.COM, which allows the constant area, code size, data statement area and variable area of any CBASIC int file to be altered without re-compiling. Its other function is to report the sizes of a group of programs (using standard CP/M wildcard naming), so that the largest can be found.

Finally, UNPROT is a pro-

gram which removes the protection from Microsoft BASIC programs saved with the PROTECT option. All the packages are written in assembler for speed, and will be supplied on a 20cm diskette. Prices range from around \$30 to \$60, with UNPROT somewhat higher at around \$100.

For further details contact Asamer Holdings at PO Box 99, Cammeray NSW 2062. □

#### BASIC-ly Innovative

IN MELBOURNE, another new business is helping to satisfy the growing community demand for knowledge about computers and programming.

Computer Tutor began courses in BASIC programming on September 6, using video instructional modules to progressively take students from the fundamentals



of BASIC to the stage where they are writing small but useful programs; a micro-computer per student is provided to enable participants to test their programs and, of course, to learn by their mistakes.

Ten and 20-hour courses are offered, and current clients range from secondary school students to retired professional people.

Enrolled students are entitled to free use of a computer at any time during sche-

### THE LITTLE BIG BOARD

- 4 MHZ Z80 CPU
- 64K RAM
- 2XRS232 SERIAL PORTS
- BATTERY BACKED UP CLOCK CALENDAR
- UP TO 4 x 8" OR 5" SINGLE OR DOUBLE DENSITY DISK DRIVES
- FULL S.T.D. BUSS
- ONLY 4.5" x 8" SIZE

**PULFADE COMPUTER NOW AVAILABLE,  
BASED ON THIS BOARD.**

**MICROCOMPUTER PRODUCTS**  
130 MILITARY RD., GUILDFORD 2161  
TEL. (02) 681-4966 — TLX AA70664

### COMPLETE DISK BASED COMPUTER SYSTEM ON A SINGLE CARD

WITH S.T.D. BUS EXPANSION  
JUST ADD DRIVES, POWER SUPPLY AND TERMINAL

**CP/M AND MP/M AVAILABLE**

IDEAL FOR INDUSTRIAL CONTROL APPLICATIONS DUE TO COMPACT SIZE AND BROAD RANGE OF OTHER S.T.D. BUS CARDS AVAILABLE

OPEN  
9 a.m.-6 p.m.  
MONDAY-SAT.

WRITE FOR A COMPLETE S100 & S.T.D. BUS CATALOGUE

duled 'open sessions', and these sessions are supervised by tutors who can provide assistance as required.

'Pay-as-you-use' access is available to others, beginning at \$3 per hour (or \$50 per month) for keyboard/processor/screen configuration, with loadings for use of disk drives and printers. A range of software is being built up for hire to users.

The facility is also offered to schools for 'computer awareness' exposure at an attractive rate, and the proprietor Bob Thompson is hoping that in the future he will be in a position to help other groups such as self-help agencies for the unemployed.

Computer Tutor's address for information: PO Box 129, Moorabbin, 3189. Telephone (03) 555 8456, or 580 3480. □

#### Digital Valium

DREAMCARDS, a Melbourne software supplier, has released a new program called 'Psychotec' that turns the personal computer into a tame psychiatrist.

Written for the MicroBee (but with full conversion instructions for any other 16K BASIC system), the program allows a dialogue between operator and computer in the style of a psychiatric interview. First developed some years ago in the USA in the controversial 'Doctor' programs, the powerful language processing logic has been entirely redesigned and refined.

The program is supplied as a booklet which contains a full expanded listing, detailed instructions for conversion to other BASICS and a complete and easily understood description of the program logic (to allow it to be modified as desired — you are only limited by your imagination!).

On its own the program is a fascinating 'game', but the detailed analysis in the

booklet allows the reader to readily comprehend how BASIC routines can be used to process and understand the English language for all sorts of applications.

Available from Dreamcards, 8 Highland Court, North Eltham, 3095, the program is \$20 and a cassette dump (MicroBee format) is \$5 extra. □

#### CP/M-68K For Motorola

UNDER an agreement with Digital Research, Motorola will sell the CP/M-68K operating system for the M68000-based EXORmacs development system, announced Tom Rolander, Digital Research Operating Systems Division vice president.

"The agreement with Digital Research is the foundation of Motorola's plan to become heavily involved with third party software for the 68000," said Bill Lowery, Motorola MOS SYSTEMS representative.

"Motorola, developer of the 68000, is the latest semiconductor manufacturer to align itself with digital research," said Rolander. "The 68000 is a very popular processor, and we feel that CP/M-68K will become a standard operating system for 68000-based microcomputers."

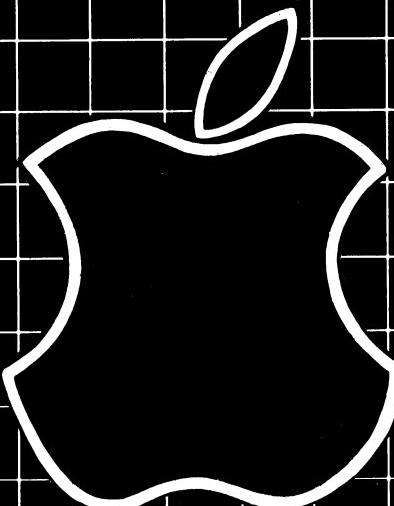
Programming languages such as CIS COBOL that already exist for the 68000 and other microprocessors allow many popular business application programs to be recompiled to 68000-based microcomputers from other 8- and 16-bit machines. Other existing languages are being developed for the 68000, including Digital Research's Pascal/MT+.

CP/M-68K maintains file compatibility with all Digital Research operating systems. Files from 8- and 16-bit microcomputers running these operating systems can be transported with no conversion to 68000-based machines running CP/M-68K. □



80 COLUMN CARD

## DOES ALL THIS PLUS



The Vision 80 video card is an easy yet sophisticated way to enhance the performance of your Apple II Computer. Just plug it in and immediately your Apple II will display a full 80 column, x 24 line screen.

The Vision 80 is compatible with existing Apple II BASIC software and provides enhanced screen performance with programs written in BASIC, PASCAL, FORTRAN, CP/M (MICROSOFT) and ASSEMBLER.

And the Vision 80 enables your Apple II to be used as a true intelligent terminal to mainframes and communication facilities.

Compatible with most good word processors, including ZARDAX, APPLE WRITER II and WORDSTAR

A superb set of 128 upper and lower case characters in a 9x11 dot matrix, including 3 dot descenders. Shift and shift lock for upper and lower case. Source switches both hardware and software between 40x24 and 80x24 screen.

**Plus: Now includes** — UTILITIES DISK, BASICS, DIAGNOSTICS, CHARACTER SET EDITOR AND DEMO PROGRAM. Supports PASCAL key press & type ahead buffer, graphics character set & underline set.

**Plus: Now available** —

VISICALC and APPLEWRITER II  
both now available in 80 column full upper and lower case on screen display.

DISTRIBUTED BY:

**IMAGINEERING**

(02) 358 3011

22 SIR JOHN YOUNG CRES, WOOLLOOMOOLOO 2011  
OR

FROM YOUR LOCAL DEALER NOW

**THE DIFFERENCE IS –  
OUR PRODUCTS WORK!!**

## **ILEHEAD Pty Ltd**

P.O Box 215, Forestville 2087

Phone: (02) 452 4435

MAIL ORDER AND WHOLESALE ONLY

## **CASHFLOW ANALYSIS**

**TRS-80 MOD I AND SYSTEM 80 \$99.00**

- Probably the most useful program the business and professional user will ever have.
- High-speed video and printer output of just about any analysis of bank transactions for a full financial year (not just current month)
- Holds 1500 entries, lists by classification, cheque book, description etc. PLUS – full video and printer output of summarised analysis sheet. – Compare cashflow with your pre-determined budget
- Requires 48K single disk system. 35-80 tracks (please state track amount when ordering)
- Full double entry system
- Program can be modified to your specifications for a reasonable fee
- Used by chartered accountants
- Ideal for multi-business or multi-cash flow situation

Please add \$2.00 P. & P.

## **HEAVY DUTY POWER LINE FILTERS**

- The only commercially available filter with varistor circuitry
- No microcomputer should be without one!

Please add \$5.00 P. & P. (They're HEAVY)

## **PROFESSIONAL UPGRADE**

To serious business and professional users. If your Model I Disk system is behaving less than perfectly – let us fit our PROFESSIONAL UPGRADE.

- Every component is checked out and replaced if necessary.
- Gold edge connectors fitted between keyboard and interface
- Many modifications to the original circuitry to increase reliability.
- Advanced design data separator fitted.
- GUARANTEED in performance to professional standard equipment from \$250.00

\$10 each way pick up & delivery in Sydney metropolitan area.

Out of town clients, please phone for transport arrangements.

(See review Your Computer, Oct. 1982)

**your computer news • your computer news**

### **Affordable Power**

SOLAR and Allied has announced a new power pack available to users of computers, especially the larger units, and a range of office equipment.

The system includes deep cycle, sealed, maintenance free, batteries, and multiples charger and an inverter, all in an attractive cabinet. The system provides a continuous stable power supply after a mains failure.

Power fluctuations and interference are eliminated through the built-in filter system, preventing loss of data and possible damage to the system. Power output ranges from 100 W to 5 KVA with larger units available on request. Filters for micros are also available.

For further information contact Ralph Morton, Phone (071) 43 2280. □

### **Big ICL Sale**

ICL, that pommie computer company which is rather better known for its mainframes than in the microcomputer end of the market, has just made its biggest ever overseas sale — for microcomputers!

The order, valued at \$US27 million, has been placed by New York State Department of Social Services for 2400 of ICL's recently announced DRS-20 multi-microprocessor based distributed resource systems, to establish a distributed data processing system throughout the state of New York. □

### **Low-Cost Winchester**

AMERICAN company SyQuest Technology has announced the industry's first 10cm removable cartridge Winchester drive which provides five Mbytes of mass storage on a single 'thin-film' metallic alloy platter.

Its half-height form factor allows two SyQuest drives to be inserted into the physical

dimension that one 13cm Winchester or minifloppy drive currently occupies.

The SyQuest SQ306 is fully compatible with the successful Seagate Technology ST506/406 13cm fixed disk Winchester drive. With identical storage capacities (6.38 Mbytes unformatted/5 Mbytes formatted), performance and data transfer specifications, track and sector formats, and control interfaces as the popular Winchesters, the SyQuest SQ306 can utilise their controller interfaces such as the DTC 510A, XEBEX 1410 and Western Digital WD 1000.

For further information contact Abacus Computers at 512 Bridge Road, Richmond, 3121. Phone (03) 429 5844. □

### **PIPS Inns?**

MANY of our readers will recall our review of the Sord M23 personal computer, and in particular, its main piece of software called PIPS, a combined spreadsheet calculator, text editor and database system.

Mitsui Computer Systems, distributors of the M23, is opening its first computer store, called PIPS Inn, at the corner of Pitt and Bridge Streets in the centre of Sydney.

The official opening was on September 30th and, all going well, the formalities should have been performed by the Liberal MP for Ku-ring-gai, Mr Nick Greiner.

Graham Young, manager of the PIPS Inn, says 'We don't just talk about computers, we talk in plain English about improving business efficiency'. At the PIPS Inn, free training will be provided with every machine sold. □

### **The Daro Fox**

DARO systems has announced the 'Fox'; a lightweight, portable computer, equally at home as an entry-level standalone system or as the

# ANYTHING IBM CAN DO....

★ president

*proudly introduce*

## COLUMBIA

16 BIT IBM PC COMPATIBLE

It's 16 BIT. It's IBM PC compatible. And it's here now! President have a new business computer manufactured by Columbia Data Systems of the USA complete with its own software and hardware. It will also run all software and hardware produced for the IBM PC.

At first glance, this machine may bear a certain resemblance to its mentor.

That's before you switch it on.

### WHAT A PERFORMANCE!

Appearances can be deceptive as a look at the credentials of the Columbia MPC machine will tell you.

Operating system software is MS-DOS® or CP/M 86®.

It's 16 BIT 8088 hardware configuration provides 128 K RAM with parity, two RS-232 serial ports, Centronics parallel printer port, DMA controller, eight levels of interrupt, dual floppy disc system with one megabyte storage, Winchester interface and eight expansion slots.

Not bad for the standard version.

### EXAMINE YOUR OPTIONS

Columbia like to leave your options wide open. So they've included 256K RAM boards, 8087 arithmetic co-processor for high speed math functions, dual RS-232/RS-422 boards, and a Winchester disc based system.

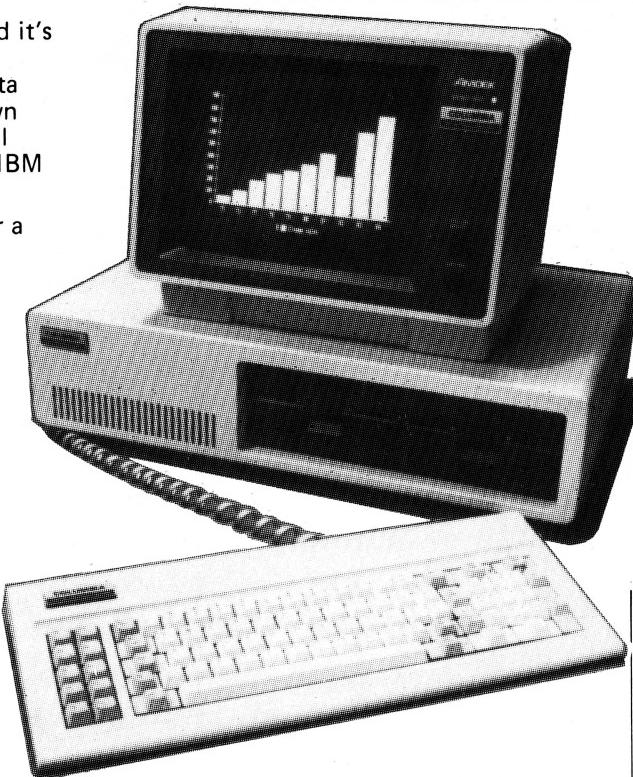
The Columbia MPC's expansion capability can easily accommodate just about any imaginable hardware configuration including one megabyte RAM and 10 megabyte disc.

### PRESIDENT GROUP STAR SERVICE

The President Group offers the services of 290 staff and over 160 vehicles, branches in all states, dealers in country areas and a service network of highly experienced professionals that's second to none. We guarantee the product, the service and the customer's satisfaction.

President is the all-Australian company that specialises in Australian business requirements.

FOR FURTHER DETAILS, OR IF YOU WOULD LIKE TO BECOME A DEALER YOURSELF,  
CONTACT



16 BIT  
IBM PC  
COMPATIBLE

Call one of the President's  
men for the name of your  
local dealer

**N.S.W. DISTRIBUTORS:**  
PRESIDENT COMPUTERS NSW

100 George Street  
Hornsby Tel 476 2700

COMPUTERMAX

539 Pittwater Road,  
Brookvale Tel 93 1383

DELTA COMPUTERS

12 Fetherstone Street,  
Bankstown

Tel 705 6636

DESKTOP COMPUTERS

10 Cowper Street,  
Granville Tel 637 3062

**VICTORIA DISTRIBUTOR:**

PRESIDENT COMPUTERS VIC

Suite 1, 609 St Kilda Road,  
Melbourne Tel (03) 529 1788

**SOUTH AUSTRALIA DISTRIBUTOR:**

PRESIDENT COMPUTERS SA

100 Pirie Street  
Adelaide

Tel (08) 223 6333

**QUEENSLAND DISTRIBUTOR:**

PRESIDENT COMPUTERS QLD

416 Logans Road,  
Stones Corner, Brisbane

Tel (07) 397 0888

**W.A. DISTRIBUTORS:**

W. J. MONCRIEFF PTY LTD  
176 Wittenoom Street  
East Perth Tel (09) 325 5722

**A.C.T. DISTRIBUTOR:**

PRESIDENT COMPUTERS A C T  
Shop 2, Warramanga Centre,  
Warramanga Tel (062) 88 2000



# president

# THE PERSONAL AND PROFESSIONAL SOFTWARE SPECIALISTS



## COMPUTER AIDED EDUCATION

Provides a stimulating, interactive, personalised and enjoyable tutorial system.

### LESSON COMPILER

- Rapidly create your own tutorials.
- Friendly and easy to use.

Step by step assistance to enter or alter lesson material. Making up new lessons, enlarging or amending an existing lesson can be done quickly and easily.

### TUTORIAL

- Immediate corrective feedback.
- Checks for partially correct answers.
- Includes sample lessons/quizzes.

Steps the student through the previously prepared lessons.

|                                    |       |
|------------------------------------|-------|
| • German Tutor .....               | \$75  |
| • French Tutor .....               | \$75  |
| • Spelling & Speed Reading .....   | \$60  |
| • Australian Geography Tutor ..... | \$75  |
| • The Universal Tutor.....         | \$75  |
| • School Reporting System.....     | \$150 |

## GENERAL SOFTWARE

Currently available programs include:

|                                 |       |
|---------------------------------|-------|
| • Universal Filing System ..... | \$150 |
| • Library Catalogue .....       | \$150 |
| • Loan System .....             | \$150 |

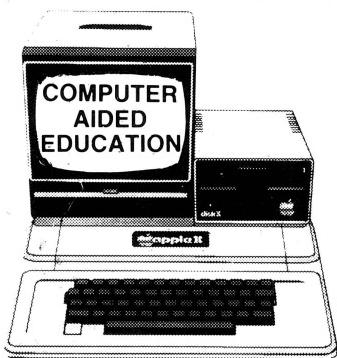
## GAMES

Sophisticated games of strategy and adventure

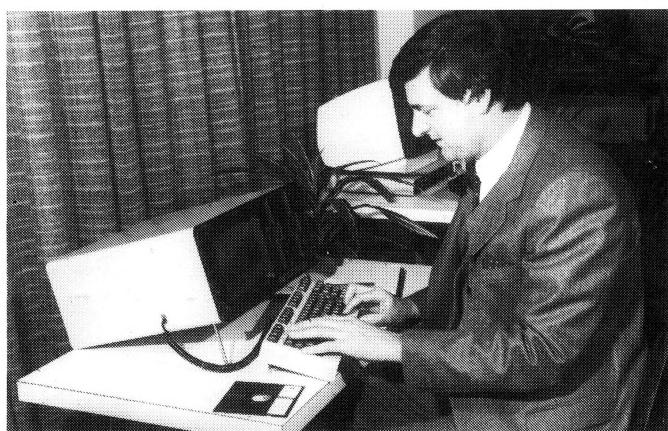
|                               |      |
|-------------------------------|------|
| • The Caverns of Mordia ..... | \$75 |
|-------------------------------|------|

## Lothlorien Farming

Cultivating New Concepts  
G.P.O. Box 1033, Sydney 2001  
Phone: (02) 398-4023



your computer news • your compute



basic building block in a local area network.

As a standalone, the Fox can be configured as a complete entry-level business system for around \$10,000. In its networking role, it can be purchased with word processing software for \$8000.

The basic system, based on the well proven Z-80A microprocessor, has 64 Kilobytes of main memory, plus 16K dedicated to the CRT control, and 2K of ROM. It features some 120 function keys, with 96 being fully programmable to facilitate subroutines and so on.

Double-sided double-density diskette drives provide 1.2 Megabytes of storage, and seven full screens of the Fox's non-glare display can be instantly stored and retrieved as required.

Full networking communications are available with the Fox, allowing for expanding office automation systems of up to 30 users. BASIC, COBOL, PL/1, FORTRAN and PASCAL languages are supported, and the CP/M operating system means that a wide range of applications software is available both from Daro Systems and other suppliers.

For further information contact Roy Bettenhausen at Daro Systems on (02) 699 3877. □

tion and Boston Systems Office (BSO), have announced an agreement whereby BSO will adapt its microcomputer development software to Digital's recently announced Professional 300 series of personal computers, and the two companies will cooperatively market both the software and hardware.

This agreement is applicable to Australia and New Zealand as well.

BSO, which is reportedly the world's leading manufacturer of universal microprocessor development software, has development packages for more than 30 families of microprocessors, representing more than 25 manufacturers' products.

By adapting proven development software to Digital's Professional 300 series, BSO will provide a low-cost means for designers and engineers to create microprocessor application programs.

Microcomputer development software to be adapted to the Professional 300 personal computers includes CA/Micro Microprocessor assemblers, SI/Micro microprocessor symbolic debuggers, object format conversion programs, and up- and down-line loading support for selected microprocessors. Collectively, the system is known as a universal microprocessor development (UMD).

Further information can be obtained from Digital Equipment on (02) 412 5252. □

Cooperative Marketing  
DIGITAL Equipment Corpora-

# THIS IS THE COMPUTER THAT WALKS TO WORK...



THAT REVIEWS THE STOCK  
AND PROJECTS THE PROFITS...



THAT RUNS THE SALARIES ...



THAT WRITES TO THE DEALERS ..



THAT EVEN A CHILD CAN USE.



WEIGHT: 11.5 kg  
Price: UNDER \$2995

## VIVA LA KAYPRO II. THE NEW REVOLUTION.

This portable business computer brings you the big screen, double density disks and more standard features.

It is Australia's most cost-efficient business partner and is priced at less than \$2995. After a worldwide review of state of the art computers, the President Group chose the KAYPRO II as the optimum portable business computer to meet the demands of Australian business. It is light, easy to operate and is presented in a self-contained, fully-earthed metal case that stores comfortably under an airline seat. The KAYPRO II is today's most aggressive combination of performance and pricing.

### KAYPRO II — MORE STANDARD FEATURES

23 cm green screen, restful to read and brightness adjustable.

80 columns x 24 rows.  
Double density disks,  
store 200,000 ch. each.

CPU: Z80™ with  
64k Bytes, 8 baud rates  
selectable. RS-232C  
interface. Full typewriter  
keyboard, 14 key numeric pad and  
cursor control. CP/M® 2.2.  
SELECT™ word processing and mail merge.  
PROFITPLAN™ spreadsheet programme.

TEACH™ — self-teaching disk for word processing. S-BASIC® INSTALL

KAYPRO II SCREEN  
23cm  
Osborne screen  
12.5cm

### PRESIDENT GROUP STAR SERVICE

The President Group offers the services of 290 staff and over 160 vehicles, branches in all states, dealers in country areas and a service network of highly experienced professionals that's second to none. We guarantee the product, the service and the customer's satisfaction.

## KAYPRO II

*The New Revolution*

Call one of the President's men for the name of your local Kaypro II dealer

**N.S.W. DISTRIBUTORS:**  
PRESIDENT COMPUTERS NSW  
100 George Street,  
Hornsby Tel 476 2700  
COMPUTERMAX  
539 Pittwater Road,  
Brookvale Tel 93 1383

DELTA COMPUTERS  
12 Fetherston Street,  
Bankstown  
Tel: 705 6636

DESKTOP COMPUTERS  
10 Cowper Street,  
Granville Tel: 637 3062

**VICTORIA DISTRIBUTOR:**  
PRESIDENT COMPUTERS VIC  
Suite 1, 609 St Kilda Road,  
Melbourne Tel (03) 529 1788

**SOUTH AUSTRALIA DISTRIBUTOR:**  
PRESIDENT COMPUTERS SA  
100 Pine Street,  
Adelaide  
Tel: (08) 223 6333

**QUEENSLAND DISTRIBUTOR:**  
PRESIDENT COMPUTERS QLD  
416 Logans Road,  
Stones Corner, Brisbane  
Tel: (07) 397 0888

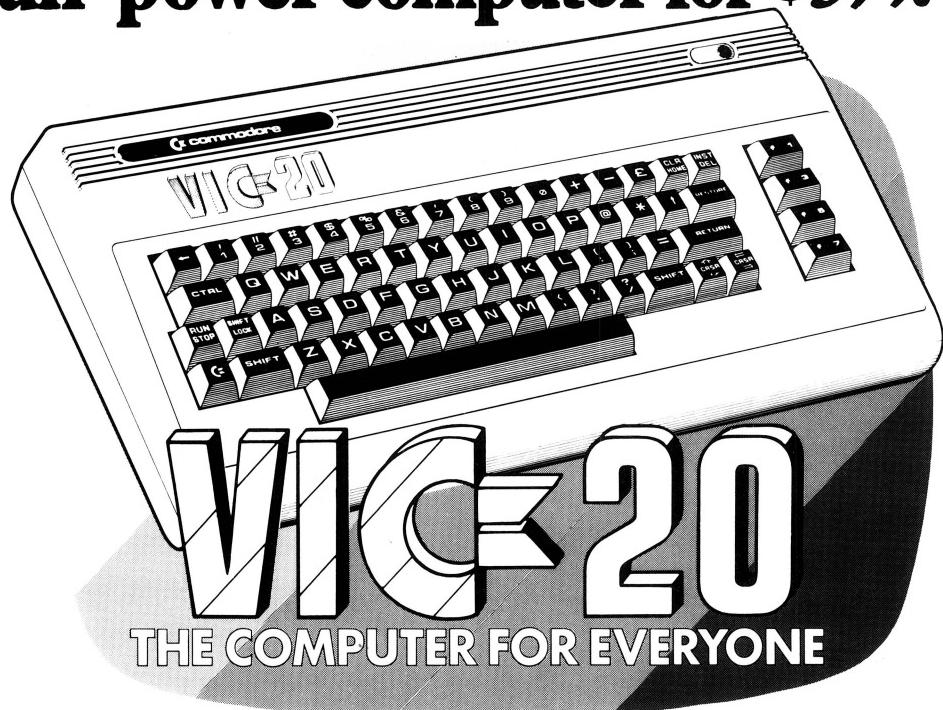
**W.A. DISTRIBUTORS:**  
PRESIDENT COMPUTERS W.A.  
248 Newcastle Street,  
Perth Tel: (09) 328 6522

W.J. MONCRIEFF PTY LTD  
176 Wittenoom Street,  
East Perth Tel: (09) 325 5722  
**A.C.T. DISTRIBUTOR:**  
PRESIDENT COMPUTERS A.C.T.  
Shop 2, Warramanga Centre,  
Warramanga Tel: (062) 88 2000

DEALER ENQUIRIES WELCOME

For further information and full specification return the coupon to:  
The Marketing Manager, President Computer Group,  
100 George Street, Hornsby, N.S.W. 2077. Telephone: (02) 476 2700  
**president**  
NAME \_\_\_\_\_  
ADDRESS \_\_\_\_\_  
TEL \_\_\_\_\_  
CD/PG5

# Where to get the world's first full colour full-power computer for \$399.



## NEW SOUTH WALES

**SYDNEY:** The Computer Spot, Shop 4, MLC Centre (02) 235 2971

**SYDNEY:** Computerwave Pty. Ltd., Cnr. George & Market Sts. (02) 238 9711.

**CHIPPENDALE:** The Microcomputer House, 116-120 Abercrombie St. (02) 698 7076

**KINGSFORD:** Micro Visions, 472 Anzac Parade. (02) 662 4063

**CROWS NEST:** City Personal Computers, 5/385-389 Pacific Hwy. (02) 922 3600

**KILLARA:** Nauta & Associates, 28 Blaxland Road. (02) 498 2858

**BROOKVALE:** Pitwater Comp. Sales, 22 Carter Road. (02) 939 6760

**GRANVILLE:** Desktop Computer Systems, 10 Cowper St. (02) 637 3062

**PARRAMATTA:** Trinity Computing, Shop 5, 1-9 Palmer St. (02) 683 4349

**LIVERPOOL:** Computer Focus, Shop 4/224 George St. (02) 600 8222

**HURSTVILLE:** Direct Computer Sales, 198 Forest Rd. (02) 570 8344  
Also at Cnr. Appian Way & Nth Terrace, Banksfown. (02) 708 5311

**BALGOWLAH:** Trevor Burton Pty. Ltd., 1st floor, 123 Clarence St. (02) 290 1233

**LISMORE:** Parrys Office Supplies, 25 Molesworth St. (066) 21 7331

**TAMWORTH:** Pacific Accounting Systems, 515 Peel St. (067) 66 5122

**CARINGBAH:** Compute Systems Pty. Ltd., 5 President Ave. (02) 525 5022

**NEWCASTLE:** New Tech 237 Hunter Street (049) 2 3343

**NEWCASTLE WEST:** Cenco Computer Systems, Shop 4, 767 Hunter St. (049) 69 2902

**MAYFIELD:** Computer Cellar Pty. Ltd., 136 Maitland Rd. (049) 67 5700

**TAMWORTH:** LST Electronics, 11 Fitzroy St. (067) 66 3162

**PORT MACQUARIE:** Central Coast Bus. Mach., The Hub Cen. Bellbowrie. (065) 83 2035

**WOLLONGONG:** South Coast Computers, 345 Keira Rd. (042) 28 7755

**WOLLONGONG:** L&B Radio TV & Hi-Fi, 250 Crown St. (042) 28 6911

**NOWRA:** Centcorp, 90 Worrige St. (044) 21 3263

**CAMDEN:** Seahorse Computer Serv., 33 Mitchell St. (046) 66 6406

**ALBURY:** Special Office Equip., 535 Hume St. (060) 21 4481

**FINLEY:** Finley Computer Service, Shop 2, 81 Murray St. (058) 83 1930

**ORANGE:** Calare Data Systems, 39 Sale St. (063) 62 6811

**ORANGE:** The Computer Orchard 1 Regency Place (063) 62 3889

**CANBERRA:**

**YARRALUMLA:** Yarralumla Software, 41 Bailey Place. (062) 82 1379

**PHILLIP:** Computerland Canberra, 22-24 Colbee Court. (062) 82 2342

**FYSHWICK:** Steve's Comm. Centre, 57 Wollongong St. (062) 80 4339

## VICTORIA

**MELBOURNE:** B.S. Microcomp P/L, 4th Flr., 561 Bourke St. (03) 614 1433

**MELBOURNE:** Computer Country 338 Queens Street (03) 329 7533

**MELBOURNE:** Computerland Melbourne City Centre 123 Lonsdale Street (03) 662 2133

**MELBOURNE:** Billy Guyatt, Cnr. Dandenong & Koornang Rd. Carnegie (03) 569 0231

**CARNEGIE:** Billy Guyatt, 1st floor, Centre Plaza Cnr. Bourke & Swanston Sts. (03) 663 1614

**RINGWOOD:** Billy Guyatt, 93-99 Maroondah Hwy. (03) 870 2611

**HAWTHORN EAST:** Computerland Camberwell 399 Riversdale Road (03) 813 1300

**ABBOTSFORD:** Edible Electronics, 50 Park St. (03) 41 5708

**MONT ALBERT:** Panatronics P/L, 691 Whitehorse Rd. (03) 890 0579

**CHELTENHAM:** Contronics, 99 Argus St. (03) 584 6311

**BENDIGO:** Minit Computer Service, 119 McRae St. (054) 43 2589

**SHEPPARTON:** Data Parts, 1-3 Naomi St. (058) 21 7155

**BAIRNSDALE:** Gippsland Computers, 167 Princess Hwy. (051) 52 5939

## QUEENSLAND

**STONES CNR:** C. W. Electronics, 416 Logan Rd. (07) 397 0888

**SOUTHPORT:** TRS Office Equipment, 115 Ferry Rd. (075) 32 3200

**MOUNT ISA:** Mount Isa Computer Centre 24 Paradise Flats (077) 43 6476

**TOOWOOMBA:** Downs Office Equipment, 203 James St. (076) 32 4733

**ROCKHAMPTON:** Rockhampton Sound Centre, 7 Denham St. (079) 27 3618

**CAIRNS:** Onro Industries, 136 Sheridan St. (070) 51 6111

**MAROOCHYDORE:** Computer Business Aids, 33 Sixth Ave. (071) 43 5551

## SOUTH AUSTRALIA

**ADELAIDE:** Abraxas Computers Pty Ltd 151 Hutt Street (08) 223 5133

**ADELAIDE:** Southern Info & Robotics, 55 Hindley Street (08) 212 7936

**ADELAIDE:** Northgate Computing Cen. 117 West Terrace (08) 212 6249

**ADELAIDE:** Computer Imports P/L, 220 Morphett Street (08) 211 8146

**RICHMOND:** Compucom Pty. Ltd., 131 West Beach Road (08) 352 7911

**GLENELG:** Sargent Electronics P/L, 6 Moseley Street (08) 294 6188

**MT GAMBIER:** Hutchessonns Comms Cenrt 5 Elizabeth Street (087) 25 6404

**RENMARK:** Lawton Electrical, 7 Main Rd (085) 86 6682

**WHYALLA:** Gulf Communications 6 Walls Street (086) 45 0208

**GAWLER:** C.H. Rehn Agencies 67 Murray Street (085) 22 4706

## WESTERN AUSTRALIA

**PERTH:** Microdata Pty. Ltd., 25 Brisbane Street, (09) 328 1179

**MIDLAND:** Lion Electronics 314 Gt. Eastern Hwy (09) 274 4519

**INGLEWOOD:** Datasoft Pty. Ltd., Suite 3/870 Beaumont St. (09) 271 7169

**LEEDERVILLE:** J.H. Bruining Computers, 136 Cambridge Street (09) 381 2070

**GERALDTON:** Pombe Pty. Ltd., 38 Marine Terrace (09) 21 5272  
Also available from all Backgammon Shops

## TASMANIA

**HOBART:** Desktop Solutions, Suite 13, 22 Murray St (002) 34 6752

**HOBART:** Quantum Computers, 194 Liverpool Street (002) 31 0222

**LAUNCESTON:** Hopwood Business Equipment, 107 George Street (03) 31 9844

**LAUNCESTON:** Advanced Electronics, 5A The Quadrant (03) 31 7075

**NEW NORFOLK:** Craws Televisor P/L, 40 Derwent Terrace (002) 61 2699

## NORTHERN TERRITORY

**DARWIN:** Computerworld Darwin, 5 Star Vill., Smith St (089) 81 7438

**ALICE SPRINGS:** Supa Secretariat 17 Hartley Street (089) 52 3027

**ALSO AVAILABLE FROM ALL DICK SMITH ELECTRONIC STORES**

**VIC 20. So much brain for so little.**

**commodore**  
**COMPUTER**

**commodore**  
**VIC-20**

**The Computer for everyone.**

**Just  
\$399**



**Why buy just a video game  
when you can get a full colour  
computer for this price.**



A computer like this would have been fiction a few years ago. Now it's a reality. It's the new Commodore VIC-20, a full-fledged, expandable colour computer that costs little more than the video games.

Everybody loves video games and the VIC-20 has some of the best. But the Commodore VIC-20 can also help the kids with their homework and mum with her home budgeting. Dad can even take the light, portable VIC-20 to the office for financial and business applications. And Commodore has many more applications on the way. With full capability for:

- Education programmes
- Recreational programmes
- Personal computing
- Includes Microsoft, PET BASIC
- Connects to any TV set
- 4 sound generators ● 16 colours
- 66 graphic characters
- Full-size typewriter-style keyboard
- Easy-to-follow instruction manual
- 25K total memory ● 5K RAM
- Memory expansion to 32K RAM

The VIC-20 is the friendliest way we know to learn computing. It has a full computer keyboard even a small child can operate. It plays music, has exciting graphics and lets you create pictures. It even tells you when you've made a mistake and how to correct it. The VIC-20 can take your children from pre-school through post-graduate studies.

**So much brain for so little.**

Learn more about Commodore VIC-20, The micro-computer you can depend on. Call or write for the name, location of your Commodore dealer nearest you.

The Commodore Information Centre, 3 Campbell St., Artarmon. NSW 2064. Phone: 437 6296

**commodore**  
**COMPUTER**

# **HUGE SAVINGS UNHEARD OF PRICES HITACHI PEACH SYSTEMS FOR LIMITED PERIOD ONLY**

## **SYSTEM A**

Peach Computer: 16K Ram Expansion • High Resolution Green Phosphorus Monitor  
• Pair of Hitachi Single Sided Single Density Drives • Dos and Microsoft Software, Full Documentation.

PACKAGE INCLUDES WORD PROCESSING AND VISUAL CALCULATION

**PRICE WAS \$4370 NOW \$2995 (Plus Sales Tax)**

## **SYSTEM B**

System as above except Hitachi Super High Resolution COLOUR Monitor instead of green phosphorus, and pair of HITACHI DOUBLE SIDED DOUBLE DENSITY DRIVES

**PRICE WAS \$5453 NOW \$3939 (Plus Sales Tax)**

## **SYSTEM C**

System as above, but substitute 8" HITACHI DOUBLE SIDED DOUBLE DENSITY DRIVE

**PRICE WAS \$6214 NOW \$4995 (Plus Sales Tax)**

## **SYSTEM D**

BEGINNERS SYSTEM: 56K Peach Computer, Green Phosphorous High Resolution Monitor, Cable, Single MPI Drive.

**PRICE WAS \$2600 NOW \$1995 (Plus Sales Tax)**

**ALL THE ABOVE SYSTEMS SUPPLIED WITH A COMPLETELY  
REWRITTEN AUSTRALIAN INSTRUCTION MANUAL**

## **OTHER SPECIALS:**

**C. ITOH PRINTERS** WITH APPLE or TRS 80 interface

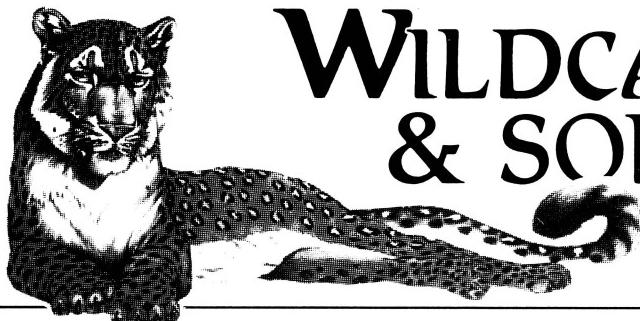
8510. . . \$1060 incl. TAX M1550 . . . \$1430 incl. TAX

**KAYPRO II** \$2950 incl. TAX (Now with \$2500 worth of software at no extra charge.)

## **VERBATIM DISKETTES**

5 $\frac{1}{4}$ " DOUBLE DENSITY SINGLE SIDED \$40.00 BOX OF 10

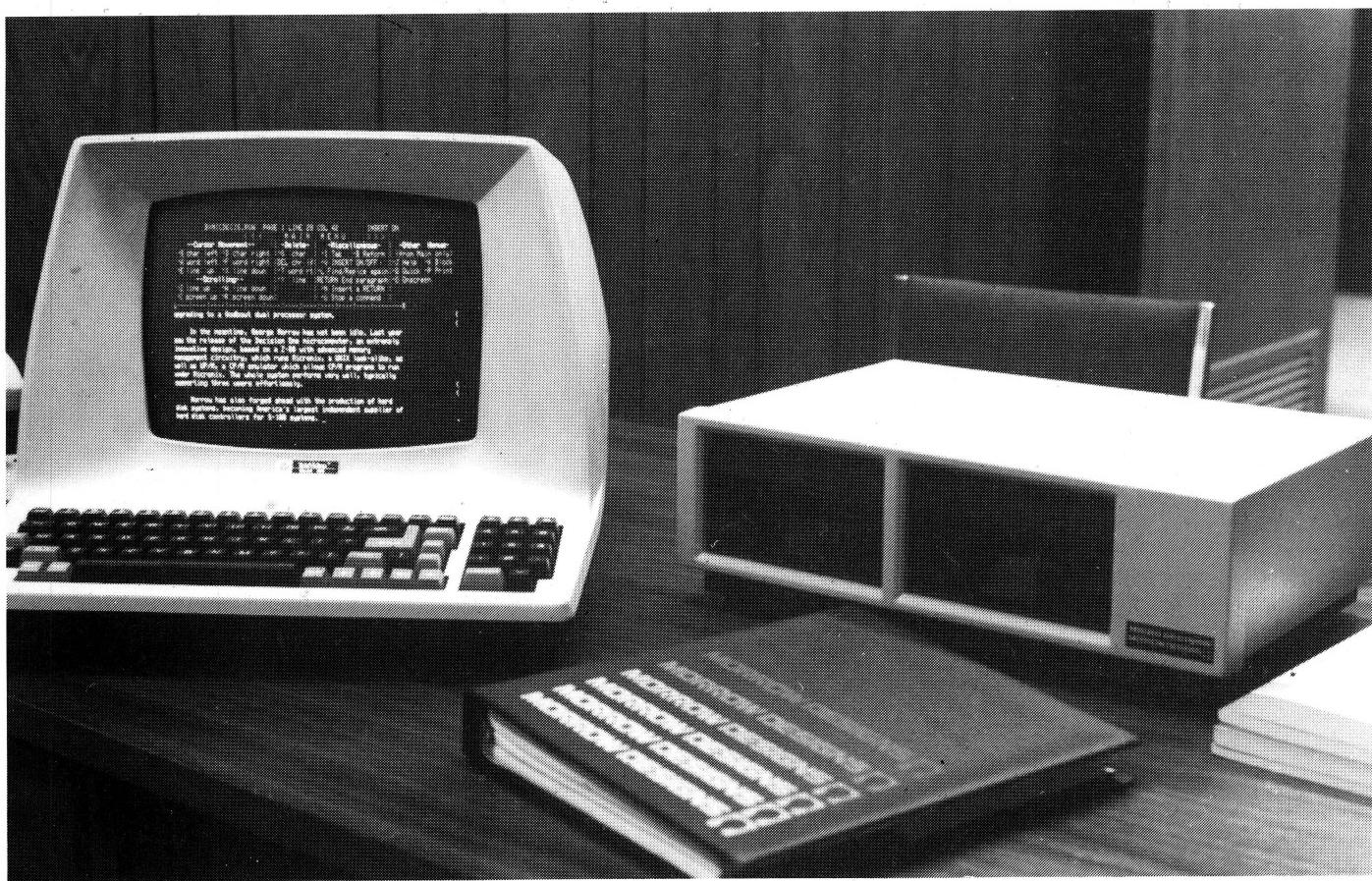
5 $\frac{1}{4}$ " DOUBLE DENSITY DOUBLE SIDED \$60.00 BOX OF 10



# **WILDCAT COMPUTERS & SOFTWARE SALES**

2/150 CRONULLA ST, CRONULLA  
PHONE: (02) 523 3505

# Decisions, Decisions



In last month's examination of the portable machines, we alluded to the new Morrow Micro Decision computer. We finally got our hands on one — here's Les Bell's evaluation...

AS MANY READERS will know, my own computer system has been based since 1978 — until recently — on boards from Morrow Designs (alias Thinker Toys).

I started off with a Morrow octal front panel, two 8K dynamic memory boards (big stuff in those days!), and Morrow's Speakeasy cassette interface. Later, a Morrow Discus 2D disk system brought the system up to business standards, and it remained that way for some time until I gradually started upgrading to a Godbout dual processor system.

In the meantime, George Morrow has not been idle. Last year saw the release of the Decision One microcomputer, an extremely innovative design, based on a Z-80 with advanced memory management circuitry, which runs Micronix, a UNIX look-alike, as well as UP/M, a CP/M emulator which allows CP/M programs to

run under Micronix. The whole system performs very well, typically supporting three users effortlessly.

Morrow has also forged ahead with the production of hard disk systems, becoming America's largest independent supplier of hard disk controllers for S-100 systems.

The latest product from Morrow Designs is the Micro Decision, a small single user microcomputer which falls in roughly

the same price bracket as the Osborne and similar machines.

Unlike these computers, however, the Micro Decision is not primarily intended for portable use, although it is certainly small enough and compact enough to be moved around easily.

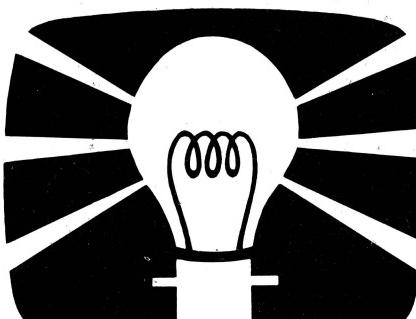
At 42 cm wide, 29 cm deep and 14 cm high, the Micro Decision is not much bigger than the pair of disk drives it contains. From this description it is obvious that it does not contain an integrated screen and keyboard, and indeed, this is its biggest advantage.

The MD is designed to work with a separate, full size, full function terminal. The user can either supply his own terminal or use the Morrow Designs terminal, which bears more than a slight resemblance to an ADM-22.

Despite its small size, the MD packs a lot of functionality into that box. The CPU is a 4 MHz Z-80A, and there is 64 Kbytes of RAM. Input/output is provided through two RS-232C serial ports, and the operating system is — you guessed it — CP/M.

It is in two areas of software that the MD particularly shines: firstly, the system software, and secondly, the application software that comes with the machine.

your computer



NEW MODEL

## System Software

The people at Morrow Designs have a good deal of experience with writing BIOS software for CP/M, what with the various disk systems they have designed over the years. This experience is reflected in the friendly features of the Micro Decision.

Virtually all of our CP/M-using readers will have experienced that mind-reeling moment when CP/M cursorily (if you'll pardon the pun) displays 'BDOS Err on B: Bad Sector' and proceeds to warm-boot you out of your program, losing all your work. This does not happen on the Micro Decision.

Instead, the BIOS traps these errors, and offers the user a choice — Abort, Retry or Ignore. Abort is what CP/M will usually do anyway; the retry option may well get round the problem if it is caused by a soft error, while the Ignore option is for those hardy souls who want to press on and try to recover the error later.

This is the kind of error handling that should have been built into CP/M in the first place. It makes life so much easier that once one has used it, one couldn't go back to comparatively primitive systems.

The Micro Decision is also particularly sophisticated in the way it manages its disk drives. Each drive has almost 200 Kbytes capacity under CP/M, which is just about enough for a single drive system to be useable; and in fact, a single drive version of the Micro Decision is available for those with particularly severe budgetary constraints.

The big drawback with single drive systems is the difficulty of copying files and backing up disks. The MD gets around this with what Morrow calls the 'Virtual Disk' feature.

At any time, if you refer to a disk drive that does not exist on the system, the MD will sense this, and re-allocate drive A: to be that drive, giving the user an opportunity to change disks. This also applies to the dual drive version — both will recognise drives up to E:.

If you're wondering whether this could be of any use on a dual drive system, here's the big plus. Three programs supplied with the MD — IBM.COM, OSB.COM and XER.COM — will manipulate the CP/M disk parameter block for the specified disk drive so that it can then read and write disks in other machine formats.

For example, typing OSB B: will reassign drive B: to be an Osborne disk drive, and you can now read and write Osborne disks. Similarly, typing XER C: will reassign the (imaginary) drive C: to read and write Xerox 820 disks.

On typing DIR C:, for example, the user will be prompted to insert his 'C:' disk into the left hand disk drive (in place of A:), and will be prompted to remove it again once the directory has been displayed.

This ability to read 'foreign disks' is a

major plus for those organisations which already have a diversity of different machines. It is almost worth buying a Micro Decision just to provide data transfer between the machines already in use, even disregarding its other features!

Furthermore, it would not be difficult for a programmer familiar with BIOS code and disk formats to write similar utilities for other disk formats. For example, we tried a Kaypro disk in the MD, and discovered that it is formatted almost identically to an IBM PC CP/M disk, and only the skew factor is different.

## User Friendly

Usually, I hate the phrase 'user friendly', regarding it as a vulgar neologism coined by ne'er-do-well computer salesmen. However, the Micro Decision has a better claim to the term than

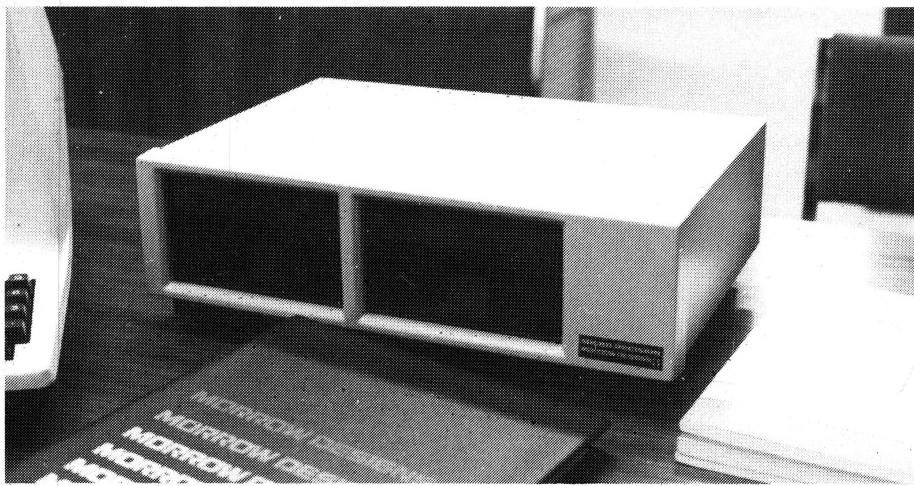
most computers, due to Morrow's inclusion of an extra language and some programs on the system.

The language is PILOT (Programmed Inquiry Learning Or Teaching) which is generally used for computer-aided instruction. This implementation of PILOT includes a number of additional features including full terminal control (cursor addressing, high/low intensity, clear screen), and the ability to chain to and return from CP/M programs.

On power-up, the standard Micro Decision system disk loads and runs PILOT, which then sets up a menu of possible commands, covering such actions as obtaining a directory display, finding disk space, running a program, and so on. The system is rather similar to Supervyz (reviewed last month) in that the user need know nothing about the CP/M operating

## Specifications and Report Card

|                          |   |                  |             |             |
|--------------------------|---|------------------|-------------|-------------|
| <b>Unit:</b>             | Morrow Micro Decision   |                  |             |             |
| <b>Made By:</b>          | Morrow Designs, San Leandro, CA   |                  |             |             |
| <b>Processor:</b>        | Z-80A   |                  |             |             |
| <b>Clock Speed:</b>      | 4 MHz   |                  |             |             |
| <b>RAM:</b>              | 64 Kbytes   |                  |             |             |
| <b>ROM:</b>              | Boot and memory test  |                  |             |             |
| <b>I/O:</b>              | 2 serial ports, disk connector  |                  |             |             |
| <b>Languages:</b>        | PILOT, BASIC-80, BaZic, plus the usual CP/M stuff                                 |                  |             |             |
| <b>Keyboard:</b>         | Matching terminal has full QWERTY, numeric, cursor and programmable function keys |                  |             |             |
| <b>Display:</b>          | 80 × 24, full size terminal   |                  |             |             |
| <b>Graphics:</b>         | N/A   |                  |             |             |
| <b>Peripherals:</b>      | Terminal, printer   |                  |             |             |
| <b>Expansion:</b>        | Extra disk drives   |                  |             |             |
| <b>Best Points:</b>      | Low, low price, full size terminal, good software                                 |                  |             |             |
| <b>Worst Points:</b>     | Should really have CBASIC 2 instead of BaZic                                      |                  |             |             |
| <b>Ratings:</b>          | <b>excellent</b>  | <b>very good</b> | <b>good</b> | <b>poor</b> |
| <b>Documentation:</b>    | ✓   |                  |             |             |
| <b>Ease of Use:</b>      | ✓   |                  |             |             |
| <b>Functionality</b>     | ✓   |                  |             |             |
| <b>Support:</b>          | ✓   |                  |             |             |
| <b>Value-for-money:</b>  | ✓   |                  |             |             |
| <b>Price:</b>            | \$1695 plus tax   |                  |             |             |
| <b>Review Unit from:</b> | Automation Statham, 47 Birch Street, Bankstown 2200. Tel (02) 709 4144.           |                  |             |             |



system, only selecting the desired activity from a menu.

Because of the way PILOT chains to CP/M programs (it sets up a SUBMIT file) it is fairly slow; however it gets the job done, and the user can see the commands being submitted on the screen as it happens, thus learning about the CP/M commands. After a while, PILOT will no longer be necessary.

The PILOT language is very simple; an experienced programmer can deduce all about it by just looking at the program listings. Thus someone who knows about the system (the office 'dp manager') can write simple PILOT programs which will offer less experienced or novice users assistance with the functions they wish to use.

Like IBM.COM et al, there is a program on the disk called AUTO.COM which will automatically patch the cold-boot command line into the CP/M CCP on the disk. Thus a completely inexperienced user can create turn-key disks which boot and automatically run WordStar, LogiCalc or other application programs.

For these reasons, the Micro Decision is very user-friendly. In a typical office, for example, if one person takes a little time to learn about the system and play with PILOT, everyone else can use the computer with minimal training.

### Application Software

Like the Osborne and similar machines, the MD comes complete with a swag of software ready to run. For starters, there's WordStar Version 3, complete with MailMerge. That will take care of all the user's word processing needs — except one: spelling correction.

That is handled by a very nice program called Correct-It, which I hadn't seen before. Complete with a 34,000 word dictionary, Correct-It is fast, and allows in-context correction of errors. An interesting feature is 'dictionary help', which displays the words around the miss-spelling in the dictionary. This can act as a memory jog-

ger if you are not sure what the correct spelling should be.

Two BASIC interpreters are supplied. First, there's Microsoft's BASIC-80, the 'industry standard'. That will run about 80 percent of all published BASIC programs. Then there's Micro Mike's BaZic, a Z-80 implementation of North Star dialect BASIC. Four versions of BaZic are supplied, with 8, 10, 12 and 14 digits of accuracy, allowing the user to trade off accuracy against speed.

For financial planning, the LogiCalc program provides all the usual spreadsheet calculator facilities, as well as linear regression capability. It seems to be similar in approach and screen layout to Calc-

Star, though perhaps slightly quicker in operation.

The documentation supplied with the system is quite comprehensive. In general, the standard manuals are supplied (for example, WordStar and MBASIC), with additional material in a Morrow folder. The machine manuals themselves are well written, specifically for the first-time user. Interestingly, the manual does not include a circuit diagram, although the system disk does carry a listing of the BIOS and boot loader.

The construction is quite rugged, and because of its compact size, the Micro Decision would fit easily under a desk-top or in place of a drawer, while the full-sized terminal means no squinting at tiny screens.

Interestingly, US market research indicates a large percentage of Osborne owners are not using their machine as a portable, so that the tiny screen can not really be said to be an advantage.

In summary, then, the Morrow Micro Decision is a very neat box of tricks. At a price of only \$1695 for a two-drive machine, complete with all the software mentioned, it offers what must be close to the most computing power for the dollar.

Complete with a terminal, the system will still be priced ahead of the completely integrated systems, and has a full keyboard and large screen. Taken with its disk-handling features, it will be hard to go past when selecting a small computer. □



# Otrona 512 -



## The Ultimate Portable?

ONE OF THE biggest drawbacks of having a computer available to you, together with a wide range of software, is that you can very easily turn into a terminal junkie.

You reach the stage where, faced with a decision like whether to invest in a cash management trust, you can't even begin to think about it without running Visicalc. When your personal phone number file is being maintained by dBase II, then you know you've got a bad case.

Really, computer addiction is not such a bad thing in itself. You do become more productive, investigate more alternatives, make better decisions — as long as a computer is available. That's the crunch. When there's no computer around, the terminal junkie is like a fish out of water.

The solution is to take the computer with you. Which is where portable computers and even programmable calculators can score heavily off the bigger machines.

It was with this reasoning in mind that I was attracted to the Otrona 512. Here's a computer that does much the same kinds of work as my 'mainframe' micro, yet is positively microscopic by comparison. It's

light enough to carry around without strain, and is rugged enough to take it.

The Otrona is manufactured in Boulder, Colorado, and was designed by some ex-Hewlett-Packard employees. It's a high quality unit: while the Osborne, for example, is really built to a price to attract a mass market, the 512 is intended for professionals who can afford to pay extra for

a high quality, full featured unit.

Despite its small size (approximately half the volume of the Osborne) the 512 has a good sized screen, with an 80 by 24 display. The CRT tube is a high resolution type, so the characters are quite well formed and easy to read. Usage over a prolonged period produced no signs of eyestrain at all.

The keyboard, which unlocks from the main case with the push of two buttons and swings down below; is compact but full-sized. There is no numeric keypad, although some of the keys will function as a keypad for typists who feel happier entering numbers that way.

The top row of keys (numbers and punctuation) do double service; combined with the control and shift keys, the top row calls for a number of the common WordStar function sequences. This does not affect the WordStar menus and the conventional key sequences so that users who are already familiar with conventional WordStar can use this version easily.

By holding down the control and escape keys, the Otrona will redefine the top row of keys yet again; this time they will

your computer



control the screen brightness, beeper volume, keyclick sound (off, click, beep), communications and printer baud rates, and bell enable. Thanks to this feature, there are no other switches or controls on the outside of the 512 apart from the power switch. Everything else is controlled from the keyboard through firmware.

The two disk drives beside the screen are Remex double-sided units, giving a storage capacity of 364 Kbytes per disk. If the disk drive door is closed with no disk inserted, the heads are locked apart, so that the machine can be safely carried around without risking damage to the disk heads.

At the rear of the unit are the AC mains connector, DC power option connector and the two RS-232C ports for printer and communications.

The whole unit is reminiscent of a small portable oscilloscope, with a Tektronix-style handle which folds under the unit to tilt it towards the user. Two settings allow either a low-profile setting for high desks, or a more tilted setting where the machine is well below the user.

For those who can easily visualise metric measurements, the box is 30.5 cm wide by 34.5 cm deep by 14.6 cm high, and weighs just 8.1 kg.

### On The Inside

The innards are fairly standard, with a Z-80A processor running at 4 MHz and 64K of RAM. Interestingly, while it is not used by any of the standard software (at least, not so you'd notice), there is a memory mapping circuit which allows software to relocate any 8 Kbyte block of memory to any 8 Kbyte virtual segment.

The main processor is aided by a DMA controller which handles disk and screen data transfers and also looks after the serial comms and printer ports.

Four Kbytes of ROM contain a bootstrap loader, diagnostics and several other useful routines such as disk formatting, I/O handlers, CRT emulators (VT-52 and ADM-3a) and other useful bits and pieces.

The screen circuitry is particularly nice, with two standard formats (80 by 24 and 40 by 24) and others obtainable with special software. Because of the DMA update of the display, the entire display can be rewritten within one frame period, so there's plenty of speed there!

Characters are formed in a 6 by 7 character cell inside an 8 by 10 block, and include proper descenders; there are 256 characters in total, including the full ASCII set, special word processing and journalism symbols (I like!), Greek and math symbols, plus accents for most languages. There's also a set of line drawing symbols.

The screen has more attributes than most reasonably smart terminals: re-

verse, intensified, underline, strike-through, subscript, superscript, double size characters and intensified background. All are driven by escape sequences and are quite easy to use.

The Otrona also features rather nice graphics facilities, to wit, a 320 dot by 240 dot display. This can be driven very easily from BASIC and other programs, and is ideal for business or scientific graphics.

Neither the graphics memory nor the standard character memory are part of the processor's work RAM, and do not chew up processor time for screen refresh — again, thanks to the DMA controller.

Two serial ports are provided for communications and a printer to be attached. These RS-232C ports are 'full' ports, with all the handshaking signals, and are also compatible with RS-422 and RS-423 standards. Baud rates are software

selectable from 75 to 19200 baud in asynchronous mode, or up to 500 Kbaud synchronously.

A real-time clock built into the Otrona is provided with a rechargeable cell, so that time, date and day of the week are maintained even when the machine is switched off. In addition, the settings of the brightness, volume and other controls mentioned above are also maintained.

The Otrona is expandable on a standard bus — no, not S-100, but rather the STD bus, a creation of Mostek and Prolog which is now supported by dozens of other manufacturers. It is especially popular with the industrial control and instrumentation fraternity, and memory cards, I/O (particularly analogue I/O) and special function cards are available from many sources.

Other mechanical options for the

### Specifications and Report Card

|                          |  |
|--------------------------|--|
| <b>Unit:</b>             | Otrona Attache   |
| <b>Made By:</b>          | Otrona Inc, Boulder, CO  |
| <b>Processor:</b>        | 4 MHz Z-80A  |
| <b>RAM:</b>              | 64 Kbytes  |
| <b>ROM:</b>              | 4 Kbytes   |
| <b>I/O:</b>              | 2 RS-232C serial ports   |
| <b>Languages:</b>        | MBASIC, plus the usual CP/M stuff  |
| <b>Keyboard:</b>         | Full qwerty, with Wordstar keycodes, no separate numeric pad                                 |
| <b>Display:</b>          | 5.5-inch, 80 by 24, green  |
| <b>Graphics:</b>         | 320 by 240, with graphics utility program  |
| <b>Peripherals:</b>      | DC power supply, multi-function board  |
| <b>Expansion:</b>        | Through optional STD bus board   |
| <b>Best Points:</b>      | Quality construction, portability  |
| <b>Worst Points:</b>     | No parallel printer interface  |
| <b>Ratings:</b>          | excellent      very good      good      poor   |
| <b>Documentation:</b>    | ✓  |
| <b>Ease of Use:</b>      | ✓  |
| <b>Functionality</b>     | ✓  |
| <b>Support:</b>          | ✓  |
| <b>Value-for-money:</b>  | ✓  |
| <b>Extras Included:</b>  | Stack of software, real-time clock/calendar  |
| <b>Options:</b>          | Battery pack, accessory pouch, STD bus   |
| <b>Price:</b>            | \$4995   |
| <b>Review Unit from:</b> | Elmeasco Instruments Pty Ltd, 15 Macdonald Street,<br>Mortlake NSW 2137. Tel: (02) 736-2888. |

Otron include a DC power option which will accept either 12 V or 24 V power, and when used with AC power, provides automatic switch-over to DC (the Otron itself provides black-out and brown-out protection for up to 2 seconds approximately).

There is also a separate battery and charger unit with 5 hour life, accessory pouch for cables, disks, and so on, and a multifunction accessory card which includes hardware math processor, GPIB (IEEE 488) interface, parallel I/O, 12-bit A/D converter, and a 300-baud modem (Bell standard, and not useable here, unfortunately).

### Shining Software

The Otron really shines in the software area. First, there is word processing; this is catered for by the famous WordStar. As mentioned above, this version of WordStar is specially installed and takes advantage of the top row of keys for special functions. In addition, the cursor control keys work correctly, something that many computers don't have yet.

The standard language supplied with the 512 is Microsoft BASIC-80, which we all know and love. No surprises there, just the assurance that it will run a swag of standard software.

While many computers have real-time clocks, the 512 is the first I've seen which has good software to really take advantage of them. Valet is a special program which handles the real-time clock and interrupts.

For example, quite often, in the middle of some word processing you might want to do a quick calculation or run a BASIC program. Valet can write the current memory content out to disk, allowing the user to run that program, and then restore the word processing program just the way it was. This can be done either from the keyboard or as a result of an 'interrupt' from the real-time clock, allowing Valet to keep track of appointments and meetings.

Valet also handles asynchronous communications with other machines.

Finally, Charton is a graphics package specifically written for the 512, and can plot bar and line graphs, pie charts and special figures.

Generally speaking, that covers the most common office applications of computers, and forms quite a useful base of software with which to introduce a computer to a small office.

### Quality Feel

The 512 seems to be very nicely built indeed; it has a feel of quality. Despite its small size, it performs just like a big machine; indeed, I found its capabilities to be remarkably (uncomfortably) close to those of my 'mainframe' which is many times larger than the Otron.

Although designed as a portable com-

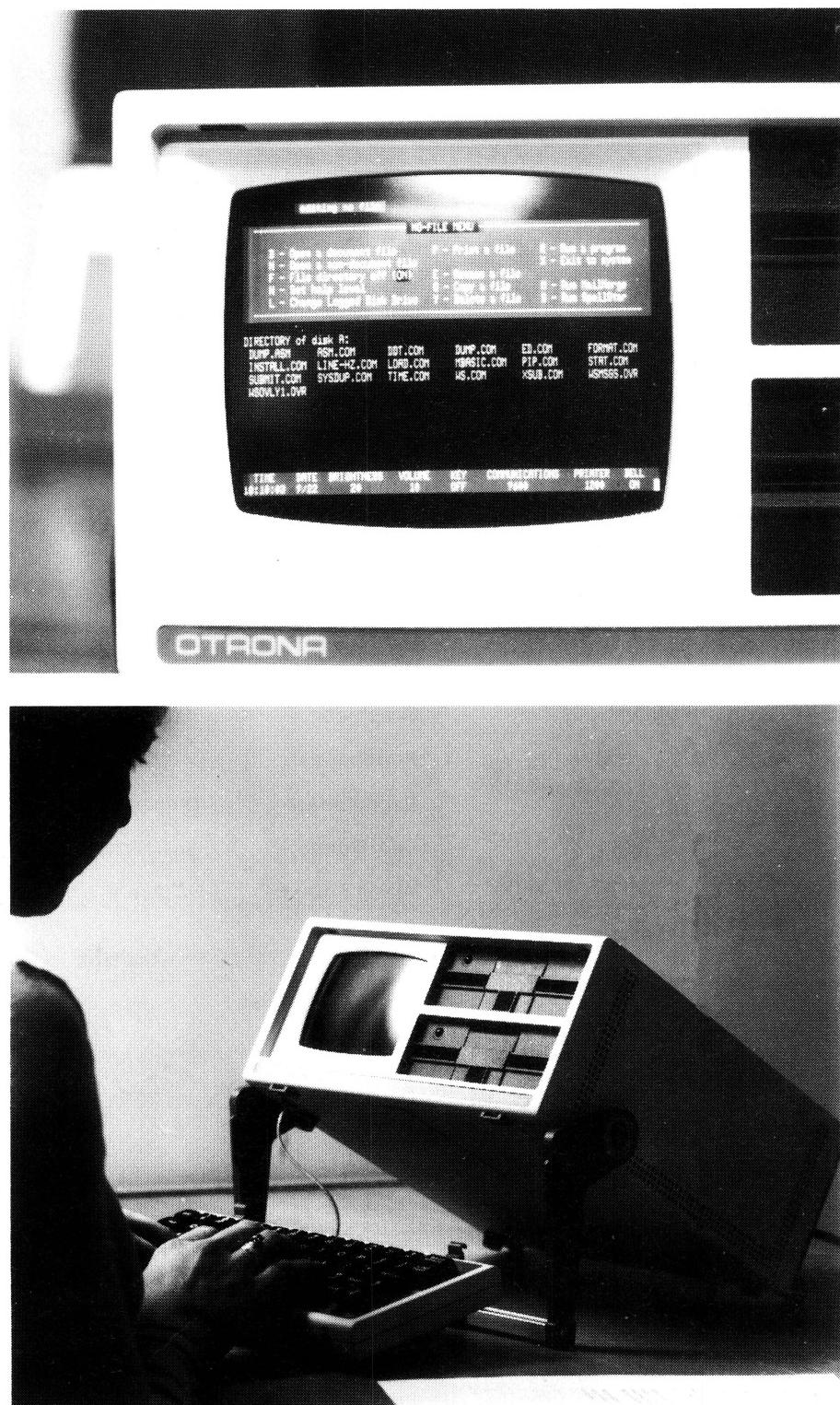
puter, the 512 is attractive enough and well enough engineered to sit on an executive's desk without looking 'strange'. As regards ease of use — I gave it to my secretary along with Otron's rewritten WordStar manual and she fell in love with it immediately.

The WordStar manual shows how to set the 512 up, insert disks and boot the system, and then proceeds through simple examples to teach the user how to use

the system. It's a well thought out piece of documentation.

Failings? A parallel printer interface would have been nice, to attach such printers as the MX-80 without their optional serial interface. Apart from that, no complaints.

For those who want a really portable computer which has manufacturer-supported graphics and comms software, the Otron is an excellent choice. □



# Sharp business computers. Let the name you know pave your way.

## SHARP PC-3201

- Basic system includes 64K RAM Processor, with separate screen, 5.25" or 8" floppy drives and printer.
- Modular and ergonomic design for ease of operation. Choice of integrated commercial packages for Australian business.
- Suitable for personal, professional and business applications.



## SHARP MZ-80B

- Basic unit includes 64K RAM, screen, plus graphic RAM, cassette and keyboard as illustrated.
- 3-dimensional, high resolution graphics.
- Standard CP/M operating systems available.
- Capacity can be expanded with 5.25" dual floppy drives and printers.
- Ideal for professional and engineering applications as well as personal business management.

## SHARP PC-1500

- Powerful 8 bit processor.
- Optional 4-colour graphic/cassette interface.
- Battery and mains operation.
- Suitable for field or office use, particularly educational, hobby and business

To: Sharp Corporation of Australia,  
64 Seville Street, Fairfield, NSW 2165. YC 1

Please send me information on

PC 3201    MZ 80B    PC 1500

Name .....

Company .....

Address .....

..... Phone .....

Sharp, the name you know for innovation in business equipment, present three remarkable computers.

Their features speak for themselves, their proven technology is your reassurance.

**SHARP®**  
We put you a step ahead



# VERSATile Forms

By Peter Sandys

THE LITERATURE accompanying Applied Software Technology's Versaform calls it a Business forms processor. The description, although apt, does not help in the conceptual understanding of what use the program is except that business is likely to benefit most from its use.

This very powerful and well written piece of software opens up new dimensions for the personal computer in the business environment, possibly as much an advancement as Visicalc was. It's not really a database, yet it is. It's not a word processor, but acts like one. It's not an inventory control system, but keeps track of stock levels — and the same applies for sales orders, warranty records, invoices, statements, back orders and personnel index forms.

Some time ago word processing programs of the likes of WordStar and Spell-binder introduced a boilerplate technique in which you filled in a form to pre-defined specifications. This could then be used to generate the form with either pre-printed stationery or blank paper.

There were limitations in that these boilerplates would need to be loaded each time you wished to fill in the form. Also, no record could be kept except for paper duplicates.

With Versaform you can design a screen which can fill out a pre-designed form with the information you require, or it will also print the form at the same time.

The power of Versaform is that you have the ability to access your forms as in a database. It is possible for you to generate reports based on selection criteria that you pre-define. The report generator can be saved for future reports based on the same requirements.

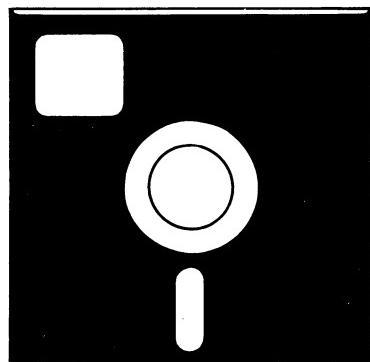
How does it work? When you design a form there are certain requirements you expect the user to fulfill when they use that form. If you have a date section you expect that to be filled in. The same for customer name and so on. If a form does not have these pieces of information it is of no use to you.

In the bad old days (or maybe even now) if the form is filled in incorrectly then this can sometimes go all the way through before it is found. Versaform has error checking facilities so that you can pre-define checking for each field procedures. I have outlined these below.

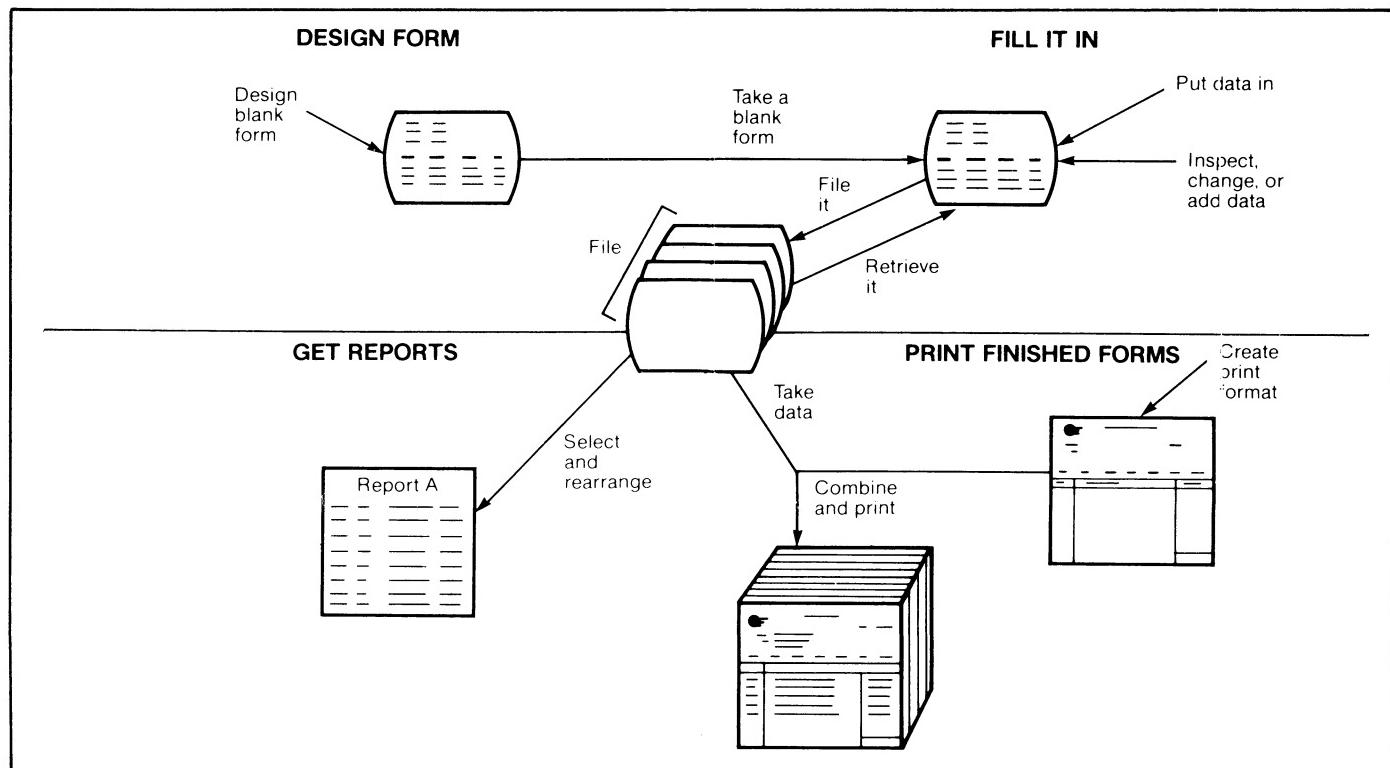
## Automatic Checking Features

- Mandatory entry. If this field is not filled in then the record cannot be accepted. Examples of this would be date, record number, customer, salesman identity and so on.
- Minimum length. For example, four digits for postcode.
- Maximum length.
- Justify. Left, right, or number of decimal places after entry has been made.
- Numeric.
- Self-Checking. You can create codes that are self checking.
- Yes or No. Either a Y or N only.

## your computer



## SOFTWARE REVIEW



- Range specific limits like 56.89 to 78.99.
- List check. By pre-defining a check list of up to 99 acceptable answers the program will only accept a valid response.
- Format. Pre-defined rules like only letters, numbers or three of each, or whatever. For example, 23-AA56 where the first two digits represents the branch. The program will also check for the hyphen.
- Lookup. The program can look up 99 pre-defined answers. This is like giving a stock number and the program fills in the name. These are pre-defined.
- Other. The program can do calculations between entries using the four basic operands. It can pick low or high numbers, total columns and calculate tax, or discounts.

Versaform is friendly and easy to use. When you design a form it has a verify section so you can be sure it is correct.

It is also possible to define certain keys as single key operations.

It comes well packaged with six disks and an exceptionally well written manual which is simple and easy to understand with examples. Included in the six disks is a tutorial disk which, when used in conjunction with the separate tutorial manual, helps you to get an understanding of the program.

The error trapping is excellent and seems bug free. It is also easy to escape from most options so that if you make a mistake you can start again, not at the beginning (unless you want to) but at the start of that option.

Once the form is set up it is easy for someone else to operate the system with only the rudimentary knowledge of how to operate the Apple (like turning it on and inserting disks).

After design of the form and the setting up of the default parameters, you then can print the form so that you have a hardcopy example to check. This is not to be confused with the print format which can be designed to print your form in a completely different style for pre-printed stationery.

With this option Versaform permits you to select how you want it printed out. For example you may wish to take the information to create a statement with a tear-off remittance slip. When you set the print format Versaform will allow you to print the same field in different locations. You can also omit information that is in Versaform from this print format. This print format is then saved on your file disk with any other

print format you may require for the same file.

This print format can be used for immediate printing after the data is entered as in the case of an invoice issued with goods ordered at the counter or at a later stage in a batch run. When making a batch run you can selectively print out your forms by, say, suburb, or total amount, or you can print all automatically or individually under the manual selection criteria. You can also use your files to print mailing labels.

One final point on the printing out of your form, under the format option you can elect to have a message printed on your form — Pay now or Die later, for example.

So how can you access information on your file apart from individual documents?

The program has a reporting function. With this you can selectively extract information from your forms. As distinct from databases Versaform limits you to direct access via the screen to enquiries made using one or two of the two key fields that you have previously defined. These fields must be unique for each form; for example, invoice number and company name. You can have two invoices to the same

company but the invoice numbers must be different.

To get access to the other bits on your form you can use the report function. In this you have the ability to select fields to sort under, and also fields to report on.

This could be used to produce a price list for wholesale use and another for retail use of items in a particular group. An ideal use is for warranty records as a report could give an alpha listing of clients and dates of purchase while another report could give the products alphabetically with the purchaser's name beside also sorted alphabetically within the subgroup.

The program will also give you totals of any particular sub-group that you request. You can use standard conditional operands like and, or, if, equals, greater than, less than. The report formats can be saved.

The uses of Versaform are unlimited. It is a package best reviewed again in 12 months when more uses for the package will be known (making my life easier).

It is a package which is best used in higher volume situations. Its limitations are based purely on the capacity of your disk drives, although it is available in a hard disk version. □

#### Software Report Card

|                          |                               |                  |             |             |
|--------------------------|-------------------------------|------------------|-------------|-------------|
| <b>Program:</b>          | Versaform                     |                  |             |             |
| <b>Made By:</b>          | Applied Software Technology   |                  |             |             |
| <b>Useful for:</b>       | See Text                      |                  |             |             |
| <b>Hardware Req'd:</b>   | Apple II, 2 Disks, 48K Memory |                  |             |             |
| <b>Ratings:</b>          | <b>excellent</b>              | <b>very good</b> | <b>good</b> | <b>poor</b> |
| <b>Documentation</b>     | ✓                             |                  |             |             |
| <b>Ease of Use</b>       | ✓                             |                  |             |             |
| <b>Speed</b>             | ✓                             |                  |             |             |
| <b>Functionality</b>     | ✓                             |                  |             |             |
| <b>Support</b>           | ✓                             |                  |             |             |
| <b>Value-for-money</b>   | ✓                             |                  |             |             |
| <b>Extras included:</b>  | Tutorial Manual and Disk      |                  |             |             |
| <b>Price:</b>            | \$480                         |                  |             |             |
| <b>Review copy from:</b> | Imagineering                  |                  |             |             |

**PORABLE BUSINESS**

**OSBORNE 1**

**NOW ★★★ KAYPRO II**

539 PITTWATER RD, BROOKVALE 2100. (02) 93-1383, A.H. (02) 918-1718

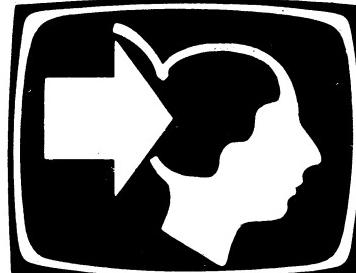
**COMPUTERMAX**

**COLOURFUL BUSINESS**

**HITACHI PEACH**

**NOW ★★★ OKI if 800**

**your computer**



**tutorial**

# **Basic For Birdwatchers**

## **Part XII**

*This month, Les continues his Odyssey through the wilderness of BASIC with a look at various miscellaneous functions...*

BACK WHEN we were working with screen handling functions, you may have noticed the MID\$ function hidden in there with no explanation. Well, here's the explanation.

BASIC offers several functions which assist in string handling. We've already seen how strings can be joined together (concatenated) by the '+' operator, so that for example:

```
PRINT "The quick br" + "own fox"
```

will print *The quick brown fox*.

On the other hand, how can you take strings apart? This can be achieved using the functions LEFT\$, RIGHTS and MID\$.

Let's take as an example the string A\$ = "The quick brown fox". The function LEFT\$, as its name implies, will return the left part of the string, so that the line 210 B\$ = LEFT\$(A\$, 7) will set B\$ equal to the seven leftmost characters in A\$, in other words, "The qui".

The function RIGHTS does a similar thing, except at the right end of the string. So RIGHT\$(A\$, 7) is the string "own fox".

MID\$ is a bit more complex. Its purpose is to extract a substring from the middle of a string. For example, MID\$(A\$, 4, 7) will move an imaginary 'pointer' to the fourth character in the string, and then extract the next seven characters. In this case, it

will return the string "quick b".

More succinctly, the function MID\$(A\$, X, Y) will return a string of Y characters, extracted from string A\$ starting at position X.

Now all of these functions are useful as long as you know exactly at what positions you are going to carve a string up. Unfortunately, text input is made up of words of varying lengths, and so we cannot assume that spaces, for example, will always be in the same positions — unless we are using an artificially structured language, for example.

This is why some languages, like COBOL, expect certain information in certain positions on punched cards. It's because the compilers that operate on the input programs are a bit simple-minded, poor things.

Fortunately, BASIC is a bit smarter than that, and most BASIC interpreters will have a function which can find the position of a given character or string in another larger string. In Microsoft BASIC, this is the INSTR function. This function comes in two flavours.

The simple INSTR looks like this: X = INSTR(A\$, "fox") and will set X equal to 17, since that's the position of the first character of the string "fox". It starts searching the string at the first character, and then finds the first occurrence of the string it's looking for. If it finds the string, it returns its position; if it doesn't, it returns zero.

What would happen with a string like "The quick brown fox jumped over the slow brown fox"? Using the simple version of INSTR to find the string "fox", it

would never find the second occurrence of the string. Obviously, we need something a bit smarter.

The smart version of INSTR looks like this: X = INSTR(Y, A\$, "fox"). Now, with Y set equal to zero or one, the search will start at the beginning of the string, and it will find the first occurrence of the word "fox".

However, with Y set to any other number, the search will start with the 'Yth' character. If Y is greater than 17, then it will find the second occurrence of the string.

Therefore, to find all occurrences of a pattern in a string, you need a loop that will look like this:

```
200 I = INSTR(A$, B$)
210 do something with I, A$ and B$
220 I = INSTR(I+1, A$, B$)
230 IF I <> 0 THEN 210
```

That will keep looping round and round until it has found every occurrence of B\$ in the string A\$. You can use this technique to count the number of words in a line and similar tricks.

To help with figuring out the values for LEFT\$, RIGHTS and MID\$, one particularly useful function is LEN. This returns the length of a string, so that, for example, LEN("The quick") is 9.

One useful trick that can be performed with these string-handling functions is to dissect names. Generally, a file of names and addresses would be indexed on surnames, and so we have hitherto written our file manipulation programs to explicitly ask for the surname before the christian name.

This month, in the wilderness...



...ON THE OTHER... PAW.... HOW CAN YOU TAKE THEM APART...?



...THIS CAN BE ACHIEVED USING THE FUNCTIONS LEFT\$...

...RIGHT\$... AND MID\$... ER.. AH.. THANK YOU, ELVIS

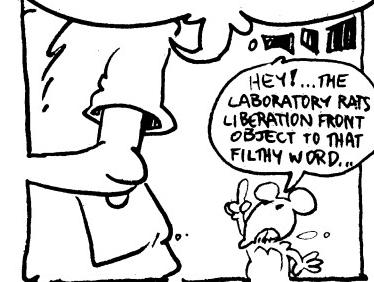


...HARDLY MICROSOFT EH?  
EH... HEH HEH HEH... AH...  
LITTLE "IN" JOKE... HEH HEH...



...ANYHOW... A USEFUL TRICK IS DISSECTING CHRISTIAN NAMES FROM SURNAMES... AND...

...AND SO... WE OOF!



...INCIDENTALLY, COM.DEC.(COME DECEMBER) ISSUE, WE'LL HAVE SOME LOGIC...



©B.J. AKHST 82.3

```

100 INPUT "Input a name";N$  

110 P1 = INSTR(N$, " ")  

120 P2 = INSTR(P1, N$, ".")  

130 C$ = LEFT$(N$, P1-1)  

140 IF P2 = 0 THEN 180  

150 S$=RIGHT$(N$, LEN(N$)-P2-1)  

160 I$ = MID$(N$, P1, 4)  

170 GOTO 200  

180 S$ = RIGHT$(N$, LEN(N$)-P1)  

190 I$ = ""  

200 PRINT N$,S$; ", ";C$;I$  

210 GOTO 100

```

However, people generally write names down christian name first, then initial, then surname. Being able to take a name written in this form and extract the surname is a useful trick. Here it is.

In this program N\$ is the full name as it is input, C\$ is the christian name, I\$ the initial and S\$ the surname. It works by looking for the first space which will follow the christian name, then looking from that point forward for the full stop which indicates an initial, and then stripping off the surname which must follow.

There are a number of other useful miscellaneous functions for handling strings. SPACE\$(X), for example, will return a string of X spaces. A similar function, SPC(X), will print X spaces on the terminal or screen.

Similar to SPACE\$ is STRING\$(X,Y). This function will return a string X characters long, consisting of the ASCII character Y repeated X times. So, STRING\$(5,43) would be "+++++". If the second argument to the function is itself a string, then the function will just use the first character. So STRING\$(5,"(A)") will be "((((((", NOT "(A)(A)(A)(A)(A)".

To convert a numeric variable into a string can be useful on occasions — for example, to take apart a part number which is constructed on some logical basis such as department numbers, and so on.

This is achieved by the function STR\$(X) which will return a string representing the number X. Of course, the same thing can often be achieved by dividing by 10 or multiples of 10 and using the INT function, but this is quicker and more elegant. If you've got it, flaunt it!

The reverse function is available — VAL(A\$) will convert A\$ into a numeric variable. As it does it, it will strip leading spaces, redundant plus signs and the like.

As you probably know, characters inside the computer are maintained in the ASCII (American Standard Code for Information Interchange) code. Characters can be converted to and from this code using two more functions, and this can be very useful on occasions. For example, how do you print a quote symbol ("")?

The most transportable way to do it is to look up its value in the ASCII code and

```

'obvious by now, I hope
'find the first space
'then the dot after it
'extract the first name
'is there an initial?
'yes, extract surname
'then initial
'and jump to print line
'no initial, get surname
'and set initial to blank
'print the result

```

then convert that into a string using the CHR\$ function. So, PRINT CHR\$(34) will print a quote. If you want to see all the characters which can be displayed by your terminal or computer, you can usually write a small program to output all the possible ASCII codes.

```

10 FOR I = 1 TO 127
20 PRINT CHR$(I)
30 NEXT I

```

In all probability, the results will turn your screen crazy, and may even turn some terminals into self-test mode (which will generally display all the characters anyway!).

If this happens to you, change line 10 to FOR I = 32 TO 127 (which removes the control characters from 1 to 32), which should be less disastrous. If your computer has chunky graphics, you may be able to see those by changing line 10 to FOR I = 1 TO 255, but the same caveat applies.

The reverse function is ASC(A\$) which returns the ASCII code for the first character of A\$. So ASC("ABCDE") is 65.

## Peeking And Poking

While BASIC was originally intended for writing simple applications programs, typically in engineering work, it has increasingly been pressed into use for what is called systems programming, that is, programs which are intended to function as part of the operating system of the computer.

This has primarily come about because on some machines BASIC is the only language and there is no operating system.

Systems programming typically involves dealing directly with memory locations, and so microcomputer BASICs provide a statement and a function to assist with this. The function POKE X,Y will place the integer value Y (in the range 0 to 255) into memory location X.

The PEEK function does the reverse. The statement Y = PEEK(X) reads the contents of location X and assigns it to the variable Y.

Now, while PEEKing is fine and dandy most of the time, POKEing is fraught with hazards. Your BASIC interpreter looks after certain locations in memory and uses it for its own purposes, and the results of poking many locations in memory are unpredictable to say the least. You could accidentally alter part of the BASIC interpreter causing disastrous results.

PEEKing is generally safe, although there is one potential danger in systems like the TRS-80 which use memory-mapped I/O (in other words, what you think are memory locations are in fact I/O ports). In such systems, reading a memory location can alter the machine's status, causing errors.





In general, though, you can use PEEK to examine memory and find out how your system makes use of its memory. Here's a short program which displays the contents of memory from E000 hexadecimal to F000 hex:

```
10 FOR N=&HE000 TO &HF000
15 IF N/16-N\16=0 THEN PRINT:
    PRINT HEX$(N); " ";
17 IF PEEK(N) < 16 THEN PRINT "0";
20 PRINT HEX$(PEEK(N)); " ";
30 NEXT N
```

Despite its length, this program illustrates several new points. First, notice in line 10 that Microsoft BASIC will accept hexadecimal constants in the form &Hxxx. Octal constants are okay too, and they have the prefix &O or just &. So &O377 is really 255.

The first part of line 15 is used to check whether N is divisible by 16. The first division is a real number division, while the second one is an integer division. Subtracting one from the other leaves the remainder from the real division, and only if this is zero is N a multiple of 16.

If it is a multiple of 16 then we print a carriage return and line feed, then print out the hexadecimal value of N — the address being examined.

The function HEX\$ converts the value of integer N into a string representing its hex value. If N is less than 16, HEX\$(N) will be a single digit, as the function suppresses leading zeros. So in line 17 we check to see whether the memory location being examined is less than sixteen, and if it is, we supply a zero to keep the dump listing even.

Line 20 prints the hex value of memory location N, followed by a space, and line 30 goes round the loop again.

With suitable modification, you can use this program to have a look into your own computer. Here's a suggestion for a modification: check to see whether the location being PEEKed contains a printable ASCII value, and if it does, print that character using CHR\$(PEEK(N)).

This will make areas of text in memory easy to spot, and you can find the keyword tables inside your BASIC interpreter, as well as error messages, and so on.

Next month, on to logic and error handling. □

## your choice of personal computer

**HITACHI PEACH**

**SIGMA/OKI**

**sirius 1 COMPUTER**

**IBM**  
RE: PAGE 75

*Lightwave*

**NEC**  
TOKYO JAPAN  
**PC8000 series**

- Green phosphor monitor.
  - 64K incl. extension unit.
  - Dual 143K drives.
  - 100 CPS dot matrix printer.
- PRICE \$4384 incl. S/T  
A HUGE SAVING

ADVANCED PERSONAL COMPUTER COMING SOON



**HITACHI PEACH**

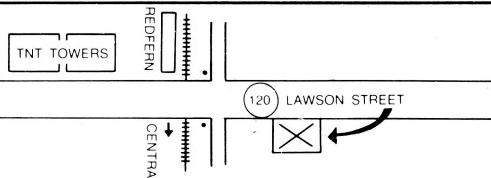
- OS9 Available for high level languages.
- 6809 Processor — fantastic for programmer.
- Superb word processing capabilities.
- Excellent business software & support.
- Fantastic colour games.
- Numeric key pad.
- Light pen.
- High resolution colour graphics.

**SIGMA/OKI**

- CP/M software available inc.: Micro pro, Wordstar, Super Calc.
- Full Padmede accounting packages.
- Superb colour graphics.
- Instant hard copy screen.
- Inbuilt printer.



**BOOKSHOP NOW OPEN**



NOW AVAILABLE THE AUSTRALIAN BEGINNING

## CYBERNETICS RESEARCH

120 LAWSON STREET, REDFERN 2016, P.O. BOX 138, CHIPPENDALE 2008

TELEPHONES: (02) 698-8286, (02) 699-3690

CONSULTANTS, SERVICE, SOFTWARE, PRINTERS OF YOUR CHOICE, WORD PROCESSING

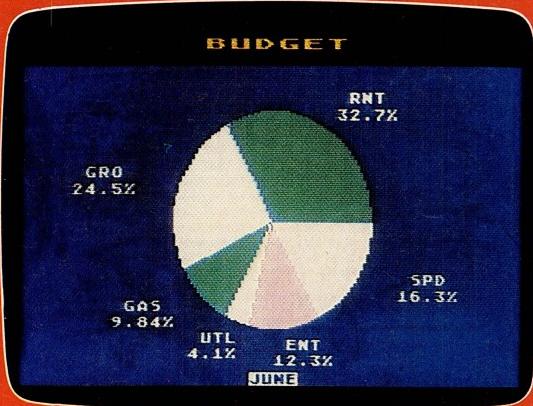
EUROPEAN COUNTRIES  
3 AND CAPITALS 3  
COUNTRY <sup>4</sup>  
CZECHOSLOVAKIA  
CAPITAL  
?



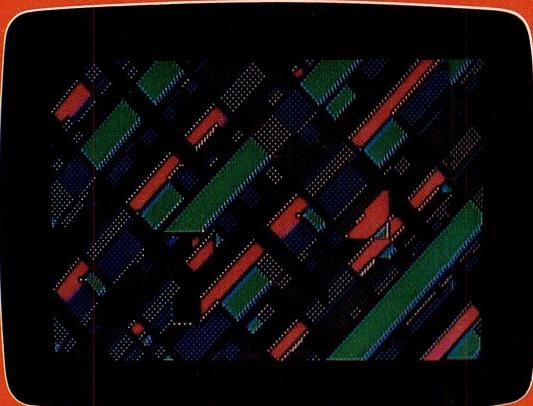
European Countries and Capitals



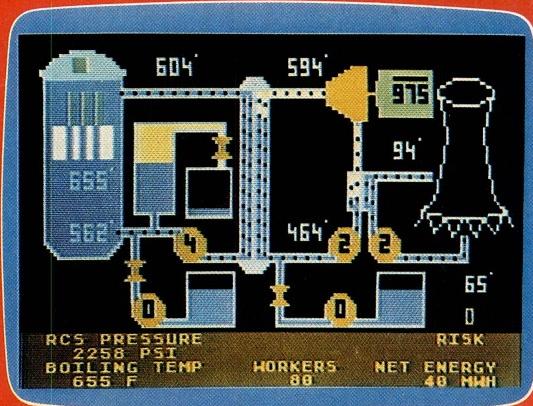
Star Raiders™



Graph It™



Video Easel



Scram™(A Nuclear Power Plant Simulation)



An Invitation to Programming™ 1



Missile Command™



Basketball

# GRAPHIC PROOF THAT ATARI® OUTPERFORMS ITS RIVALS.

## Graphic Display

By simply plugging the Atari® into your own TV you instantly have at your finger tips a whole new world of graphic display.

Unparalleled colour and luminosity up to 128 colour luminance combinations.

Your screen has 192 horizontal lines each containing 320 dots.

A separate micro processor delivers colour and luminosity to each dot.

Now you can understand how Atari® Home Computers offer spectacular colour and graphics.

That's the performance level you can expect from Atari®.

## Sound

Through your TV set four separate synthesizers let you create an incredible range of sound.

## Languages

For maximum control of the extraordinary capabilities every Atari® 800/400 is able to operate with a wide variety of operating languages. You have the choice for your Atari® 400, Atari® Basic, Assembler Editor, Pilot, Macro Assembler-32K, Ext. Fig. Forth 16K Tape 24K Disc. For your Atari® 800, Atari® Basic, Microsoft Basic, Ext. Fig. Forth-16K Tape 24K Disc, Lisp-48K, Macro Assembler-32K, Atari® Pascal-48K and Assembler Editor for

assembly language programming.

## Expandability

The Atari® 800 Home Computer is based on a modular operating system and means you can update whenever new technology develops. Memory expansions that require no more than inserting additional RAM modules which are expandable to 32K on the 400 model and 48K on the 800 model.

## Entertainment

In addition to the excellent range of educational and practical software programmes you are also able to run such games as Star Raiders™, Pac Man™ and Missile Command™ on your system, providing family entertainment, spectacular graphics and unbelievable sound.

## Features

Few manufacturers can match the range of features we include in our Home Computers: Powerful Basic languages. 10K operating system in ROM and 16K RAM. The Atari® Home Computer System is a truly upgradable system providing state-of-the-art technology at the touch of a finger tip.

Consult your Dealer today for an Atari®. It is a distinct cut above the current crop of personal computers both in quality and price.

# ATARI® HOME COMPUTERS

For your family's future.

Yes! I would like more information on the Atari® Home Computers. Send the coupon to:  
Futuretronics Australia Pty. Ltd. 79-81 Levanswell Road, Moorabbin, Vic., 3189.



NAME

ADDRESS

POSTCODE

OCCUPATION

For a no obligation demonstration of the Atari® Home Computers' amazing capabilities, see your nearest Atari® dealer: VIC: Computerland (Lonsdale St., City), Myer (City and Highpoint West), Calcutronic (Hawthorn), Logic Shop (Prahran and K-mart Burwood), Brashs (City, Blackburn and Geelong), Billy Guyatts (Carnegie, Ringwood and City), Computer Country (City), Gametronics (South Yarra), Dandy Sound (Dandenong), Bill Wonder (Greensborough), Computers 2000 (Frankston), Warehouse Sales (Frankston), Associated Micro Technology (Cranbourne). NSW: Grace Bros. (All stores), Computerwave - Myer (City), David Reid Electronics (City), Computer Connection (Miranda), The Logic Shop (Chippendale), Computermax (Brookvale). QLD: Myer (All stores), The Electronic Circuit (The Valley), Alliance Computers (Annerley), Exec-U-Games (Queens Arcade, Wynnum Plaza, Burleigh Heads and Maryborough), V.H.S. (Queen St. and Gold Coast), Qalton (Valley), Datacom (Bundaberg), Gametronic (Rockhampton), Fields (Mackay), Games and Creative Toys (Townsville), Middle Earth Hobbies (Gladstone), Ipswich Hi-Fi (Ipswich Centre Plaza), Music Maker (Brisbane and Mt. Isa), Computer Shop (Darwin), Ken Elbourne (Southtown Shopping Centre and Toowoomba). WA: Vision On, Parrys, Microbase, Computer Age, The Backgammon Shops, Nth West Audio (Karratha), Vision On (Port Hedland), Greyhound TV (Bunbury), Don Jones & Co. (Kalgoorlie). SA: John Martins (Rundle Mall), Magnetex, Video World, Sargent Electronics, Metropole Business Equipment, Key Computer. ACT: Computerland (Canberra) TRADE ENQUIRIES: Vic 5559544, Qld 3525645, WA 3496111, NSW 6931144, SA 2946188

# your computer text file

## Candid Comment

I AGREE with the comments in your editorial of June, 1982. The material you have presented in the past year has been interesting, readily assimilated, good value for money; in a word, excellent.

Could I offer a few comments on the type of information I and probably a good few other readers are looking for, this may also be of some help to you to maintain your present high standard in the future.

I will confine my comments to (a) tutorials and (b) reviews. Perhaps I should also mention that I have had limited experience using Fortran and BASIC (many years ago) and want to brush up this knowledge by developing business application and mathematical (curve fit and statistical analysis) programs on the Hitachi Peach.

For my purposes, your series of BASIC articles has been spot-on, particularly where the need is specified and means of meeting it are discussed. What really places your series above the average is your concluding discussion on its limitations (for example, the Telephone Directory program on page 56) therefore giving the tyro programmer the incentive to look for and try alternative and better methods.

Can you continue to do this (if it is not already planned) to show the content of the routines that make up typical business programs, word processors, disk operating systems, and so on.

With regard to reviews, I am pleased to see you are prepared occasionally to draw attention to real limitations that you see to exist.

In closing, two final points. Firstly, I would like to know more about how programs are protected against copying or listing if you would care to discuss (or illustrate) this delicate subject.

And finally, thanks for your Annual Index — this was an unexpected bonus as I had just started preparing my own. However, next time please, could we have it provided as a centre-fold liftout (unillustrated!) for separate filing and preferably free of advertisements (for maximum compactness).

Name With-held  
Restrevor, SA

## Sinclair Games

I WOULD like to inform you of our range of ZX software and hardware, for inclusion in *Your Computer*.

At the moment, we have a range of

arcade games, and a music composer program. Arcade games include Asteroids, Space Intruders and Defender. Soon we will have Scramble and a ZX Disassembler. All games have flicker-free, machine code moving graphics and are priced at \$19.50. Music Composer is also machine code, and costs only \$15.00.

The hardware range includes an 8 Octave Sound Board and I/O Port (\$60), a Hi-Res, Programmable Graphics Board (\$60), a 16K RAM pack (\$80), and a 4K RAM pack (\$45). Interested owners can send for our complete catalogue by sending a SAE to this address: National Sinclair ZX Users Group, Accessories Dept., PO Box 148, Glen Waverley, 3150 (NZ enquiries welcome.)

D Karliner  
Glen Waverley, Vic

## No Do-It-Yourself

AS A newcomer to the personal computer field, I purchased *Your Computer* for August 1982 and found it to be very informative and 'chatty' magazine.

However, I must take you to task for your replies to two letters in that issue in the Clinic column — the letters by D Astbury and D Croton.

Both of these writers requested/suggested program ideas for future publications, but your reply was to tell them to write their own! I am a reader of the same position — I too seek program ideas to use, modify and learn from, and when I seek help I wouldn't appreciate being told to do it myself!

From my reading of your magazine, and other publications, I find myself a little (?) inadequate in two areas, and perhaps you could consider these suggestions for possible future articles:

1) A comparison table listing the main program commands for the various computers showing equivalents. This could perhaps be mainly for the major micros such as the Atari, System 80, Vic-20, Apple, ZX81, TRS-80 and Microbee, that would be used by relative 'beginners'. This would enable faster adaptation of programs printed in your magazine for their own machine. I realise that all commands couldn't be translated, but any would help!

2) A short explanation, with examples of use, advantages, usefulness, construction, problems, limitations and so on of many of the jargon/special items encountered when one starts reading about

the features of various microcomputers.

I would include such things as 300/1200 baud; RS-232 interface; S-100 interface; parallel and serial ports; Z-80 expansion; CP/M; machine language; how PROMs and EPROMs can be programmed and examples; and more. How about a "Finding Out About It Corner" each month?

BRUCE FAIRHALL  
Blayney, NSW

## Been Chomped Lately?

WHAT HAS happened to you? Have you been 'chomped' by the Chomp?

Three monthly issues of *Your Computer* have passed with no Sorcerer column, which I look forward to with each delivery.

Is the Sorcerer falling into oblivion, that the same reader service offered by Apple, Tandy and so many others, is not worthy of articles or pocket programs.

As a Sorcerer owner, with little knowledge of the versatility of a computer, I rely on example programs to gain that knowledge.

How-a-bout putting pen to paper and giving us Sorcerer owners a few pocket programs or just a few useful hints on how to get maximum use out of our computer.

RUSSELL GERDES  
Gladesville, NSW

Unfortunately, we can't do everything ourselves — even if we did have a degree of expertise on every machine available, there aren't enough hours in a day!

We have to rely on contributors, and it seems there just aren't any who are interested in providing regular (or occasional) material for the Sorcerer.

If the machine is falling into oblivion, it is its own/the owners' fault, and there is little we can do about it. Let it be known here and now that we will heartily welcome (and publish) worthwhile contributions for any machine.

## Pleased As Peach

AS A Peach owner, I was most pleased to see a column for this machine has been initiated. Would you mind passing the following topics on to Mr Swinkels for inclusion (if not already planned) in future issues, please.

a) I have been unable to obtain from the local Hitachi agent, any information on the content of its ROM for possible use of subroutines incorporated in it in my own programs. Could we have a listing with an

# your choice of personal computer

 HITACHI PEACH

SIGMA OKI

 sirius 1 COMPUTER

IBM

RE: PAGE 75



explanatory commentary, please.

b) The demonstration disk plays a number of musical tunes. I have only been able to get endless BEEPs so far. Could you elaborate, please.

c) The "WHEELS" program was most interesting and instructive but please could future listings be a little larger with Os and Os differentiated.

D J OSMOND  
Rostrevor, SA

## Good One, Rod!

IN ROD Stevenson's TRS-80 column it had a program that 'drew' Lotto numbers, and it said, "As I said in June, it won't win for you, and probably won't do as well as you could by picking the numbers yourself."

Well, I typed this program into my TRS-80 Model 1 and won myself \$500! How's that for luck?

M MASLEN  
Carlingford, NSW

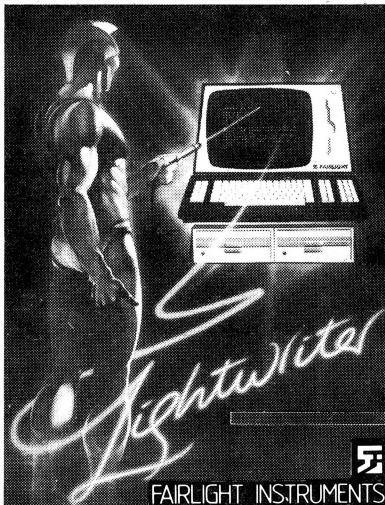
  
NEC  
TOKYO/JAPAN  
PC 8000 series

- Green phosphor monitor.
  - 64K incl. extension unit.
  - Dual 143K drives.
  - 100 CPS dot matrix printer.
- PRICE \$4384 incl. S/T  
A HUGE SAVING

ADVANCED PERSONAL COMPUTER COMING SOON

  
sirius 1  
COMPUTER

- 16 Bit processor; large memory, greater speed, more power, fantastic communications capability.
- CP/M 86 & MS DOS software available.
- IMS business software packages customised for Australian use.
- 2 x 600K floppy disk storage, upgradable to 1.2 Mb.



## LIFE WAS MEANT TO BE EASIER

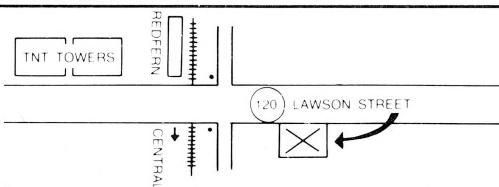
The Lightwriter Professional Word Processing System.

Rapid text entry, convenient editing, easy document storage. Mathematics, communications and high level languages.

- Instant access editing and fast menu selection.
- Special function keys.
- Fast global search.
- Light pen positions cursor at any character on the screen.
- 15" screen, 25% larger than most.

24 MONTH WARRANTY —  
AUSTRALIAN MADE

 BOOKSHOP NOW OPEN



120 LAWSON STREET  
CENTRAL  
REDFERN  
TNT TOWERS

 NOW AVAILABLE THE AUSTRALIAN BEGINNING

## CYBERNETICS RESEARCH

120 LAWSON STREET, REDFERN 2016. P.O. BOX 138, CHIPPENDALE 2008  
TELEPHONES: (02) 698-8286, (02) 699-3690  
CONSULTANTS, SERVICE, SOFTWARE, PRINTERS OF YOUR CHOICE, WORD PROCESSING

**CUSTOMIZED TECHNOLOGY**

Specializing in support for the **V.M.P.C.**

**EXPAND YOUR BABY**

REFER: CATALOGUE FOR CARDS AVAILABLE

P.O. BOX 424  
799 6373 ASHFIELD. 2131 799 6373  
NSW



call us for  
**CP/M®**  
software

Every product we sell is backed up by our **exclusive**  
Software Maintenance Plan

If you have any problems just call one of our experts, we're  
here to help you and we know what we're talking about

some of our products

BACKUP  
BASIC-80 Compiler  
BASIC-80  
BT-80  
CBASIC-2  
CB-80  
COBOL-80  
COMPARE  
CP/NET  
dBASE-11  
DATASTAR  
DIRECTORY-SORT  
DISZILOG  
FIX

FORTRAN-80  
MACRO-80  
MASTER  
MENU  
muLISP + muSTAR-80  
muMATH + muSIMP-80  
MICROSPELL  
M/SORT-C  
PASCAL MT+  
PEACHTREE IV  
PL/I-80  
PLINK II  
Q  
QII

SELECTOR III-C2  
SELECTOR IV  
SUPERSORT  
SUPERCALC  
SPEED-PRINT  
SPELLBINDER  
SPELLCHECK  
STATPAK  
SPELLSTAR  
T/MAKER  
WORDMASTER  
WORDSTAR  
XLT86  
ZSID



**THE CP/M EXPERTS**

SHOWROOM: 89 OXFORD ST, BONDI JUNCTION. N.S.W. P.O. BOX 364, EDGECLIFF 2027. (02) 389-6388

# your computer text file

## Atari Comments

IT IS GOOD to see more information appearing about the Atari 400 and 800 computers. I would like to comment on the article by Chris McEwan and the letter by Bill Mallett.

The PAL-D version of the Atari, as imported into Australia, has the GTIA graphics chip and actually has twelve graphics modes. GRAPHICS 11 allows you to have 128 different hues on screen at the same time!

The March newsletter of the Michigan Atari Computer Enthusiasts was almost entirely devoted to this chip and a detailed description of Atari graphics handling.

Their address is PO Box 2785, Southfield, Michigan 48037, USA; they produce a very professional 30 page newsletter/magazine and have an electronic bulletin board going 24 hours a day. Their subscription is US\$15 a year and I would recommend it to any Atari owner.

I don't altogether agree with Bill Mallett about the 400 keyboard. It certainly feels different from a conventional one but I

found myself getting used to it quite quickly. For a start, each key does have a marked rim around it which helps greatly. I concede that someone trained on a conventional keyboard would have problems adjusting but, on the other hand, a person trained only on the new keyboard would probably develop slightly different skills and handle it quite well.

Another nice thing about the Atari, rarely mentioned, is that, because Atari has aimed at the home and education market, it has designed the machines to be handled by children. This can be of great assistance to us fumble-fingered adults! For example, opening the ROM cartridge compartment lid turns off the power.

The machine is far more than a child's toy however and new built-in facilities keep popping up. For example, it turns out that the four ports for joysticks, games paddles, and so on can be used for input or output and the Atari has the virtually unique ability to handle analogue inputs without special external circuitry — so,

suddenly, all sorts of control applications become possible.

BARRY THOMPSON  
Mt Gambier, SA

## You Blew It...

ON PAGE 74 of the September issue of Your Computer there were a couple of errors that need to be corrected.

First, the Logic Chart was lacking two very important signs. the first "(X Y)" should be (X is greater than Y) while the second one should be (X is less than Y).

The second mistake, unfortunately, was due to my careless typing. The program TV Cricket should read on line 90: LET P=RND(5) rather than LET R=RND(5). I believe if these amendments were not passed on to the readers then the meaning of that particular space would be wasted.

JEFFREY CHI POON  
Camberwell, Vic

# Software compatible HARD DISK SYSTEM for TRS-80<sup>TM</sup>-Model 3



The MICRO-80 Winchester Hard Disk System plugs onto the expansion port of a Model 3 disk system in seconds to give you over 27 times the storage capacity and up to 20 times the data transfer rate of a standard double density disk drive. Now your Model 3 can become a serious business computer capable of handling the most demanding applications. The DOSPLUS 4.0 operating system supplied is compatible with most Model 3 programs and adds the following enhancements to your operating system and disk basic.

- Single volume addressing/Double sided floppies seen as one drive—one file can expand to limit of the hard drive
- Hard Disk—disk editing utilities
- Incredible I/O speed
- Runs any combination of densities or tracks
- Also operates 8" drives with special hardware—comes with expanded users guide and complete DOS technical section on I/O calls and DCB organization

- Ability to use hard drive as the "system" drive
- BASIC array sort—multi key, multi array
- Tape/Disk-Disk/Tape utility (with relocator)
- Input (controlled screen input)
- Random access and ASCII modification on Diskdump
- BASIC checks for active "DO"
- Backup and Format from a "DO" file
- Much improved Backup (more reliable)
- I/O package much faster (disk access time reduced)
- Repeat last DOS command with "/" (ENTER)
- Short directory (filename and extension) available
- Short directory of Model III TRSDOS disks
- Single file convert from Model III TRSDOS
- COMPLETE device routing supported (DOS and BASIC)
- Ability to save BASIC programs directly to another machine's memory (if equipped with DOSPLUS 3.4)

MICRO-80 Winchester disk drive subsystem complete with DOSPLUS 4.0

5 Mbyte \$2995      10 Mbyte \$3775

**MICRO-80**

TM TRS-80 is a trademark of Tandy Corporation

433 Morphett St. Adelaide (08) 211 7244  
P.O. Box 213, Goodwood, S.A. 5034

# Sandys Revisits Sandy's



Dramatic changes in speed, improved documentation, refinements in display, new mailing list sort capabilities, postal group sort and additional printer commands — they're the updates one of Australia's most active programmers, James 'Sandy' Donald, has made to his Apple word processor since we first looked at it. Peter Sandys, who only wishes he was related, examined it...

THE WORD PROCESSING market for the Apple has become increasingly competitive.

There are in excess of 30 programs available, some of which, like WordStar and Spellbinder, require major changes to your hardware — changes which add considerably to the cost of your equipment. While the power of these programs is not in dispute, some of the lower cost packages are more than sufficient for everyday word processing.

Of all the packages I have tried for the Apple, there are only three on my short list — Screenwriter II, Zardax, and Sandy's.

It is significant that the latter two are Australian programs, and I'm not being influenced by national pride — these two have by far the best features of any word processor. What of Screenwriter II? Its main advantages are the software-developed 70 column display, meaning it is not necessary to purchase additional hardware. However when it comes to printing out your document the change

over from the editor to the run off section is extremely slow. Also the editor can be slow in the insert mode.

Zardax I reviewed last month and found it extremely easy to use and exceptionally well documented. I will not repeat myself on the program in this article.

The first major difference you notice with Sandy's word processor is the documentation. James Donald (yes, he is the author, not me) has rewritten the manual and provided a padded brown binder.

The improvement in presentation is at least 200 percent. It is easier to read and gives a greater attention to details and examples. This was one of the biggest criticisms of the program from owners of older versions, and from intending purchasers who felt that if the manual was that bad the program would be also.

However, even though the manual has been improved it has only reached the stage where it should have been when the program was first issued. It has yet to reach the minimum standard expected of a word processor today. There is also an error on the summary card which could make things difficult for a new owner — the control-W command is wrongly labelled as control-up arrow.

It's a bit like Ford introducing a new Falcon which has twice the economy and not bothering to polish the body before the advertising launch.

The only consolation is that obviously James has decided that, because of this limitation, he is still only going to market the program at \$195. With my background in marketing I am not really convinced that this is wise especially as the product itself has improved dramatically.

## Faster Than A Speeding FDOS!

The major change to Sandy's is the speed of loading of the program and text files. In a short test I was able to load 16K of a document in four seconds — under the old Sandy's this took 90 seconds! Saving of a program takes slightly longer.

This speedup saves considerable time and effectively increases the power of the program. One previous feature that was handy, the scratch file for large documents, was cumbersome because of the time to load a file. In my test the new version took only 45 seconds to load a 100K document. This one feature in itself is a major argument in favour of Sandy's. For professional people it is essential to increase the speed of loading.

The next change is in the display. The program now has word wrap-around. I found this feature difficult, even annoying, at first but I have now adjusted to its effects and find it quite useful. James has also inserted visible carriage returns into the 40-column version of the program.

The scrolling effect is also different; it seems jump more than before but is faster. I was always impressed by the smoothness of the screen display but this seems to be a casualty of this speeded up scrolling.

The delete-a-line key has a click added to it so that you are more conscious that you are deleting text. This is a nice refinement.

One final thing changed in the editing mode is the control-N and control-V which previously moved up a paragraph or down a paragraph. These have now been modified to move up and down a line. This has been a welcome addition especially for

editing as the previous commands jumped too far and then you seemed to take forever to reach the word or letter you wished to correct.

### Mailing Sorts

Sandy's always had a mailer program so that you could insert details into a form letter, a very nice 'free' feature. The one thing that it lacked was the ability to sort this list.

Quietly, around the end of last year (or maybe the beginning of this — it was so quiet) the ability to sort your mailing list was added. I have not tried it out but the manual states you can sort any field into alphabetical order. This then gives you the ability to select blocks of your data to selectively mail without having to use a separate program as in the past.

When sorted the new file is saved with the mail-list name and suffix .sortN where N is the number of the field you sorted the list under. Linked with this is a Postal Group Sort, which will sort a mailing list into the complex NPSP (National Pre-Sorting Plan) postcode order to suit Australia Post. Mass mailings qualifying for bulk discounts need to be presented in this order, as do Category B publications such as newsletters and magazines.

The program has new printer control commands: .SPACE, which can change the spacing of characters in a document;

### Software Report Card

|                          |                                  |                  |             |             |
|--------------------------|----------------------------------|------------------|-------------|-------------|
| <b>Program:</b>          | Sandy's Word Processor           |                  |             |             |
| <b>Made By:</b>          | Wytand Pty Ltd, Sydney           |                  |             |             |
| <b>Useful for:</b>       | Word Processing                  |                  |             |             |
| <b>Hardware Req'd:</b>   | Apple II                         |                  |             |             |
| <b>Ratings:</b>          | <b>excellent</b>                 | <b>very good</b> | <b>good</b> | <b>poor</b> |
| <b>Documentation</b>     | ✓                                |                  |             |             |
| <b>Ease of Use</b>       | ✓                                |                  |             |             |
| <b>Speed</b>             | ✓                                |                  |             |             |
| <b>Functionality</b>     | ✓                                |                  |             |             |
| <b>Support</b>           | ✓                                |                  |             |             |
| <b>Value-for-money</b>   | ✓                                |                  |             |             |
| <b>Extras included:</b>  | Mailer, sort, postal group sort  |                  |             |             |
| <b>Price:</b>            | \$195                            |                  |             |             |
| <b>Review copy from:</b> | City Personal Computers, Sydney. |                  |             |             |

.HEADER, which inserts a heading at the top of each document page; and .PAGE No, which sets the page number for the next page. This can be used in conjunction with the .HEADER command.

In summary I am suitably impressed

and believe this word processor, although lacking the polish of presentation of other programs, is exceptional value and worth persevering through the somewhat spartan (although much improved) documentation. □

# Level 2 Rom ASSEMBLY LANGUAGE TOOLKIT

Interested in writing machine language programs for the TRS-80 Model I or III or the System 80? Whether you are a beginner or an expert a Level 2 ROM Assembly Language Toolkit will save you hours of work and frustration.

#### The 'Toolkit' Manual

Expert Edwin Paay produced this Rom reference manual. It catalogues, describes and cross-references useful and useable Rom routines that are easily incorporated into your own machine language or BASIC programs.

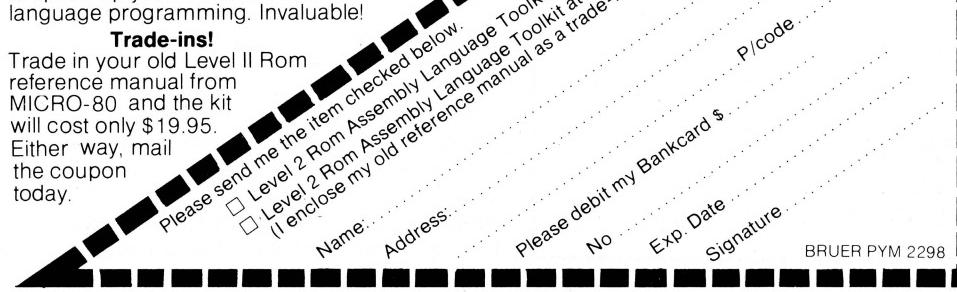
#### The 'Toolkit' Program

DBG — distributed on cassette and

able to be used from disk or cassette — is a machine-language disassembling debugging program to speed up your own machine-language programming. Invaluable!

#### Trade-ins!

Trade in your old Level II Rom reference manual from MICRO-80 and the kit will cost only \$19.95. Either way, mail the coupon today.



# HEARD ON THE BUS

By LEON YENDOR

MICROCOMPUTERS must be a real blessing to the publishing industry. Not just for the advances made in the mechanics of putting a paper together but mainly for the tremendous appetite of the readers of magazines dealing with small computers.

Until micros came along very few people would have ever considered having airmail subscriptions to their favourite journals, more likely one would patiently wait until three months after the cover date for their appearance on a newsstand. Now it is common to find the gap much shortened even at the newsagent.

All of this haste costs money and heavier and heavier copies coming on ever increasingly expensive airmail means that the cost can be quite high.

An airmail subscription to the ubiquitous Byte magazine now costs US\$129 although there is quite a high penalty for being in Australia in comparison with some other countries for which I've never been able to get an explanation.

So where to spend your money?

## Some Of The Leaders

Having just mentioned Byte perhaps we should deal with that heavyweight first.

For most of us who don't really need to be first on the block with everything it is best to wait until you can pick up a copy at some local source thus paying only about \$4.95 a copy. The Dick Smith stores usually beat the news-stands by a month or two but never seem to have enough



copies so you'll have to drop in regularly not to miss out.

In the US most people working in the industry only read Byte to see the ads but there are some very valuable gems from time to time and unless they really become complacent it will remain a leader in circulation.

Another pioneer in the field is Dr. Dobbs' Journal of Computer Calisthenics and Orthodontia.

Commonly referred to just as Dr. Dobbs, it derived its title from its motto 'Running light without overbyte' which was coined in reference to the fact that the first issues were about the provision of very small Basic interpreters designed to fit the very small memory usually found in micros in the early years.

If you're new to the game you probably don't remember that the first Altair had only 256 bytes fitted on a 1k board and that as late as 1978 16k cost about as much as 64k does today.

The need to really cram has mostly gone now but this magazine still has some of the best software published appearing in its pages. If you want to get in to the writing of systems software and utilities you couldn't do better than to subscribe and even collect the bound volumes of back issues for reference and the historical value.

A commercial venture with some of the same flavour but touching more heavily on hardware is Microsystems (originally called S-100) edited by Sol Libes of the Amateur Computer Group of New Jersey. It is published by David Ahl of Creative

Computer and is particularly good for CP/M users and S-100 hardware owners who like to keep up with what's new without wading through all of the Byte ads. I know Bill Bolton wouldn't miss an issue of this one.

## Mostly Software

Lifelines is a product of Lifeboat, the software supermarket in New York and consequently reflects to some extent the policy of its publisher.

That is not to say the reviews are biased or that they never come down heavily on some software houses, but there is always the feeling that it is not too independent.

For all that it is valuable for its contributions from such greats as Ward Christensen and the listing of current version numbers and new user group releases. Strong reader pressure may cause them to explore areas not covered at present and there have been recent signs of this.

## Specialist Papers

Those with areas of particular interest are served by a number of publications.

In the case of magazines devoted to particular brands of equipment you'll have to decide for yourself whether you can get any worth from the particular magazine as these are too specialised for someone like me to evaluate when I don't have the equipment about which each is centered.

There are a number of special interest groups documenting advances in such techniques as graphics and robotics. Their papers are usually distributed to members and study of the periodicals list of the IEEE and ACM (Institute of Electrical and Electronic Engineers and Association for Computing Machines) would be helpful to those seeking this kind of material.

## Where To Get Them

**Byte:** Some newsagents and Dick Smith stores sell individual copies. Subscriptions from: Byte Subscriptions, POB 590, Martinsville, NJ 08836, USA. \$35 surface, \$129 airmail per year.

**Dr. Dobbs:** People's Computer Company, Box E, 1263 El Camino Real, Menlo Park, CA 94025, USA. \$62 airmail per year.

**Microsystems:** Microsystems, POB 1987, Morristown, NJ 07960, USA. \$32.97 surface per year.

**Lifelines:** Lifelines, 1651 Third Avenue, New York, NY 10028, USA. \$50 airmail per year.

**IEEE publications:** IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854, USA. □

## DICK SMITH Electronics



### SYSTEM 80

Australia's fastest selling computer

NOW A NEW MODEL WITH EVEN MORE FEATURES AT A LOWER PRICE!

- AUBURN 648 0558
- BANKST. Sq 707 4888
- BLAKEHURST 546 7744
- BONDI JNC 387 1444
- BROADWAY 211 3777
- BROOKVALE 93 0441
- CHULLORA 642 8922
- GORE HILL 439 5311
- NORTH RYDE 888 3200
- PARRAMATTA 683 1133
- SYDNEY 290 3377
- TIGHES HILL 61 1896
- WOLLONGONG 28 3800
- TAMWORTH 66 1961
- FYSHWICK 80 4944
- MELBOURNE 67 9834
- COBURG 383 4455
- RICHMOND 428 1614
- SPRINGVALE 547 0522
- GEELONG 78 6363
- FRANKSTON 783 9144
- BURANDA 391 6233
- CHERMSIDE 59 6255
- ADELAIDE 212 1962
- ENFIELD 260 6088
- DARLINGTON 298 8977
- HOBART 31 0800
- PERTH 328 6944
- CANNINGTON 451 8666

NOW AVAILABLE FROM CASE

# THE STAR 80 cps PRINTER FOR UNDER \$500



## The CASE STAR

- 80 cps Bi-directional, Logic Seeking.
- Tractor & Friction Feed standard.
- 80, 96, or 132 Characters/Line.
- Double width & Graphics Characters.
- Programmable Line Spacing.
- Vertical Forms Control.
- Parallel & Serial Interfaces ex stock.

For full details on the STAR and other CASE products phone Sydney (02)438 2400, Melbourne (03)233 6255, Adelaide (08)271 4299, Brisbane (07)376 2830, Canberra (062)51 3711, Hobart (002)34 4522, Perth (09)325 1344, or post the coupon.

**CASE Communication Systems Ltd.**

1-3 Atchison Street, St. Leonards N.S.W. 2065

Please forward details on the CASE STAR.

Name: \_\_\_\_\_ Phone: \_\_\_\_\_

Company: \_\_\_\_\_

Address: \_\_\_\_\_

Post Code: \_\_\_\_\_

# WIN ARFON COMPETITION

PRIZES  
WORTH  
OVER \$1000.

ARFON EXPANDER BOARD FOR VIC-20 COLOUR COMPUTER

RUN IN CONJUNCTION WITH: COMPUTER CELLAR, VIC SOFT, COMPUTER IMPORTS  
REFER TO ADVERTISEMENT PAGE 58

**1st prize . . . VALUE \$516.95.**

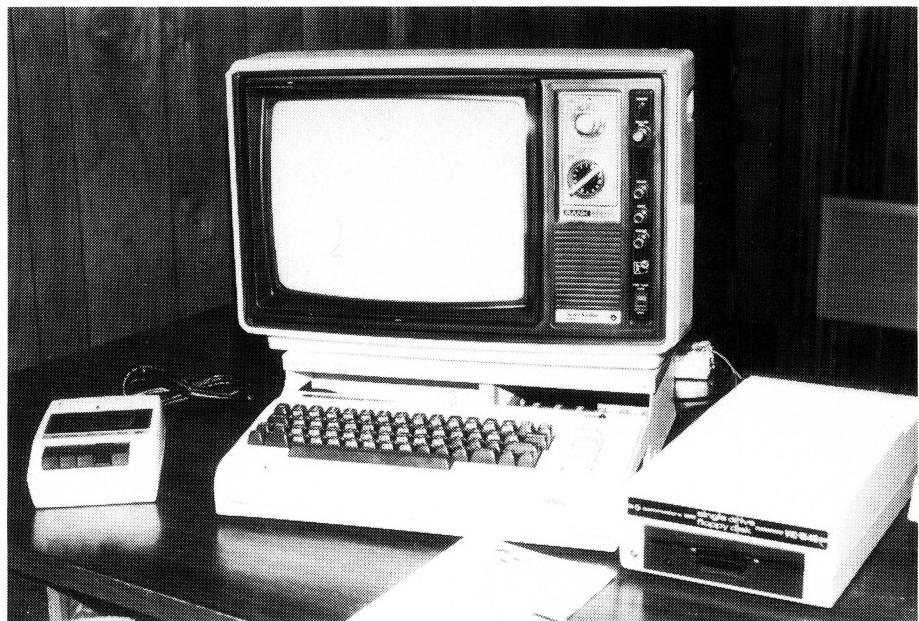
ARFON EXPANDER BOARD PLUS 3K,  
8K, 16K (FULL RAM EXPANSION).

**2nd prize . . . VALUE \$378.00.**

ARFON EXPANDER BOARD PLUS 16K.

**3rd prize . . . VALUE \$249.00.**

ARFON EXPANDER BOARD.



## THE RULES

1. The official entry forms will be published in the September, October & November issues of **Your Computer**.
2. There is no limit on the number of entries by each person. Photocopies or other facsimiles of the entry coupon will be accepted.
3. Employees (and their families) of Eastern Suburbs Newspapers (plus any company, group or individuals associated with the printing, distribution or sale of this magazine or with the running of the competition) are not eligible to enter.
4. The closing date of entries is 5 p.m. on December 15, 1982.
5. The winners will be notified by telegram and the result will be published in the January **Your Computer**.
6. **Your Computer's** decision will be final, and no correspondence will be entered into.

## ----- OFFICIAL ENTRY FORM -----

SEND TO: ARFON COMPETITION  
YOUR COMPUTER MAGAZINE  
P.O. BOX 21  
WATERLOO N.S.W. 2017

NAME \_\_\_\_\_

ADDRESS \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

POSTCODE \_\_\_\_\_ PHONE \_\_\_\_\_

Permit No. T.C. 82/1368 issued under the Lotteries and Art Unions Act.

## QUESTIONS:

1. How many slots in the Arfon expansion unit .....
2. Does the Arfon include built in power supply .....
3. Does Arfon make a 3K, 8K & 16K plug in memory cartridge .....

| Please fill in               | Yes                      | No                       |
|------------------------------|--------------------------|--------------------------|
| I own a VIC                  | <input type="checkbox"/> | <input type="checkbox"/> |
| I am interested in expansion | <input type="checkbox"/> | <input type="checkbox"/> |
| I am interested in Software  | <input type="checkbox"/> | <input type="checkbox"/> |
| Business                     | <input type="checkbox"/> | <input type="checkbox"/> |
| Games                        | <input type="checkbox"/> | <input type="checkbox"/> |
| Utilities                    | <input type="checkbox"/> | <input type="checkbox"/> |

**your computer**



**tutorial**

*This month, Les Bell looks at the design of a monitor program for an 8080, 8085 or Z-80 based microcomputer.*

SO FAR we've looked at routines to perform a number of different functions, including input/output, arithmetic and block moves and searches. It's now time to start putting some of these routines into use, through the design of a simple monitor program.

For those who don't know what a monitor program is, here's a brief description. While many computers these days have BASIC in ROM available on power-up, many systems of more general design have only a bootstrap or in some cases no program at all in memory when switched on. In the old days a front panel consisting of switches and lamps was used to deposit binary instructions into memory and then start the processor executing them.

Generally, the short program keyed in through the front panel was a bootstrap, a short program which would then read in a proper error-detecting loader from paper tape. This loader would then bring in the operating system, BASIC interpreter, or whatever, again from paper tape. A short exposure to this kind of operation soon convinces one of the virtues of floppy disks or even cassette tapes!

Now, front panels are quite expensive, mechanically unreliable in comparison with the rest of the CPU, and add complexity. They have their uses, but much of their job can be done by a monitor program, and so most microcomputer and

# Understanding Assembler

## Part VIII

minicomputer systems today have dispensed with the front panel and replaced it with either a bootstrap ROM which loads the operating system from floppy disk, or a monitor program which loads the system from cassette tape.

The monitor program is a software equivalent to the front panel. It allows the user to 'get inside' the machine, and examine memory locations, change them, start programs running, load programs, save programs, dump parts of memory in either hexadecimal or ASCII, and perform miscellaneous other functions.

### System Design

Many of the functions that a monitor performs have already been introduced in this series, and some others we will have to program as we go along.

In any project of this nature, it is best to set down a complete description of your aims and objectives and to think these out quite carefully to avoid conflicts and take note of any compromises that may be necessary.

I should point out at this stage that I am in fact designing this monitor as we go; 'live' so to speak, and it is not already complete and ready to be produced like a rabbit out of a hat.

This way, we may well pursue a couple of blind alleys; start designing one approach to a problem for example, only to decide that is the wrong way to do it and start again a different way.

That is the real world of program design — particularly with assembly language. Many people become discouraged when they find themselves unable to come up with brilliantly structured programs first time; they don't realise that authors of

programming textbooks are only showing the last in a long line of programs they have refined, usually over years. They can't do it first time either!

This monitor program is intended for use in the design of I/O interfaces and therefore high on the list of priorities is the ability to read and write I/O ports.

This is the major facility missing from DDT that I wish it had, and one that is likely to be of most use to many CP/M'ers. It will also fit in nicely with our companion series on logic and interfacing.

Apart from that, the intention is to provide facilities generally comparable to most monitor programs, or indeed DDT. In addition, the monitor will implement an input-output structure similar to that of CP/M, so that programs developed under it can be transported to CP/M without major difficulty.

### Machine Dependencies

This raises the major problem of ensuring that the program can be used on as many different machines as possible.

Of course, we are limited to using the 8080/Z-80 family of machines, but the monitor should run on just about any machine based on one of those chips.

For example, it should make no difference whether the host machine uses an external serial terminal or whether it has a built-in screen like the TRS-80. It should also make no difference how much memory the machine has, be it 16K or 256K.

For this reason, it seems logical to follow the example set by CP/M in having a machine independent portion (supplied by Digital Research) and a machine dependent portion, the BIOS (Basic Input

Output System, supplied by the user or computer manufacturer).

Our first task, therefore, is to decide on a common standard for input/output code, and it seems reasonable to again follow CP/M, for the simple reason that it provides a pre-defined standard and the experience gained in this will be useful to CP/M users in customising their own systems.

For ease of development under CP/M, initial versions of the monitor will load at address 0100H, but later we will produce a version which moves itself into high memory in order to debug CP/M programs in low memory.

## BIOS Functions

The functions implemented in our I/O section will be the non-disk functions of CP/M 2.2, and they will be entered via a jump table as follows:

| Hex          | Name   | Function                          |
|--------------|--------|-----------------------------------|
| <b>addr.</b> |        |                                   |
| **00         | BOOT   | Cold start entry point            |
| **03         | WBOOT  | Warm start entry point            |
| **06         | CONST  | Check console status              |
| **09         | CONIN  | Console input                     |
| **0C         | CONOUT | Write character to console        |
| **0F         | LIST   | Write character to printer        |
| **12         | PUNCH  | Write character to punch device   |
| **15         | READER | Read character from reader device |

Some of these functions will be differently implemented from a standard CP/M 2.2 system.

In particular, the PUNCH and READER functions will probably be redefined to work with cassette tape, so that instead of operating on a single character, they will read or write an entire block of data. That remains to be worked out.

Furthermore, the BOOT and WBOOT functions do not have much meaning under a monitor, as the entry points to the monitor will be part of the monitor itself.

The most important parts to note and to start coding are the CONST, CONIN and CONOUT routines, as these will be essential to even a simple monitor. They have to work as follows:

CONST: this routine checks the console status and returns a value in the accumulator. The value is 00H if no character is ready, and FFH if a character is ready.

CONIN: this routine gets a character from the keyboard and returns with it in A. It can either do its own status checking, or it can call CONST, but in either case, it waits until a character is ready and then reads it.

CONOUT: writes the character in register C to the console. It does its own checking of the output status, and once the console is ready to accept the character it writes it out.

All of these routines are not required to preserve the register contents and so may use all the processor registers. The calling program has the responsibility of saving its registers on the stack if necessary.

## Typical Code

Here is some typical code for a device, using a 2651 UART chip. This chip has two registers which are of most importance here: the status register and the data register. The status register has two bits to indicate the condition of its receive and transmit buffers.

If bit 1 is high, then a character has been received and can be read from the data port. If bit 0 is high, then the transmit buffer is empty, and a character can be sent by writing it to the data port.

This example is fairly straightforward;

```

        org      0100h
data    equ     00h          ;data port
stat    equ     01h          ;status port
mode   equ     02h          ;mode port
cmmnd  equ     03h          ;command port
rbf    equ     00000010b    ;receive buffer full bit
tbe    equ     00000001b    ;transmit buffer empty bit

start: jmp     init

; this is where the monitor will go

        org      0200h

; JUMP TABLE
init:  jmp     boot
       jmp     wboot
       jmp     const
       jmp     conin
       jmp     conout
       jmp     list
       jmp     punch
       jmp     reader

; boot performs initialization of the 2651 UART and any other
; functions you may need

boot:  mvi     a,11101110b    ;asynchronous, 8 bits no parity 2 stop bits
       out    mode
       mvi     a,0111110b    ;9600 baud
       out    mode
       mvi     a,00100111b    ;set up command port
       out    cmmnd
       ret

; console status routine, returns 0 if no char, 0FFH if character avail.

const: in     stat
       ani    rbf           ; mask rbf bit
       rz
       mvi     a,0ffh         ; if no data, return with zero in A
       ret
       .           ; otherwise put 0ffh in A
       .           ; and return

; console input routine

conin: in     stat
       ani    rbf           ; get status from UART
       jz    conin          ; mask rbf bit
       in     data           ; wait for character
       ani    7fh            ; get character
       ret
       .           ; strip high bit

; console output routine

conout: in     stat
       ani    tbe           ; get status from UART
       jz    conout          ; mask tbe bit
       mov    a,c            ; wait for buffer to empty
       out    data           ; move character into A
       ret
       .           ; and send it

; other functions dummies for this example

wboot:
list:
punch:
reader:
       ret
       .           ; return
end

```

others may not be so lucky. Owners of memory-mapped video boards, for example, may need to write simple routines to write a character to the screen, or at best, re-write the code supplied with the boards to output from the C register, and then reassemble it.

TRS-80 owners may well be able to find a routine in the machine's ROM to do the job for them; otherwise they will have to write a routine from scratch.

Next month, the monitor code will start with memory dump routines. □

# VECTOR 4

## VECTOR 4 SPECIFICATIONS

### Central Processing Unit:

Processors: 8-bit Z-80B® and 16-bit 8088  
(single or multiprocessor operation)  
Clock Speed: 5.1 MHz  
Memory: 128K Dynamic RAM Standard  
Expandable to 256K

### Video Display:

Screen: 12 inch high contrast green phosphor  
20 KHz Horizontal, 60 Hz Vertical  
Alphanumeric: 24 Lines x 80 characters  
High resolution 16 x 13 dot matrix  
High Resolution Graphics: 640h x 312v pixels (B/W)  
Gray Scale Graphics: 160h x 312v pixels, 16 levels of gray  
320h x 312v pixels, 4 levels of gray  
Color Graphics: External RGB Monitor  
160h x 312v pixels, 8 colors  
320h x 312v pixels, 4 of 8 colors

### Keyboard:

Detached, with 8035 auxiliary processor. Capacitance keyswitch with 91 keys, including 15 programmable special function keys, cursor control keys, and 10-key numeric pad for rapid data entry.

Coiled cable with Interface

### Input/Output:

Serial Keyboard  
Centronics Parallel Interface  
Qume/NEC Parallel Interface  
RS-232 Serial Printer Interface  
RS-232 Communications Interface  
RGB color signals  
Programmable Tone Generators and Speaker  
S-100 expansion slots

### Disk Drives:

|                 |  |  |
|-----------------|--|--|
| Type of Disk:   | 5 <sup>1</sup> / <sub>4</sub> " Floppy | 5 <sup>1</sup> / <sub>4</sub> " Winchester |
| Total Capacity: | 630 Kilobytes                          | 5 Megabytes                                |
| Transfer Rate:  | 250 Kilobytes/sec                      | 5 Megabytes/sec                            |
| Rotation Speed: | 300 RPM                                | 3600 RPM                                   |

### Configurations:

Model 4/20 Two floppy drives  
Model 4/30 One floppy drive and one Winchester hard disk drive

I'd like to know more about Vector computers

Please send me additional information

Please tell me where I can get a demonstration

Name .....

Title .....

Company .....

Address.....

Nature of Business.....

Planned Applications.....

Mail to: Fiona Dicker, Dicker Data Projects Pty. Ltd.  
78 Captain Cook Drive, Caringbah, N.S.W. 2229.

\$4995



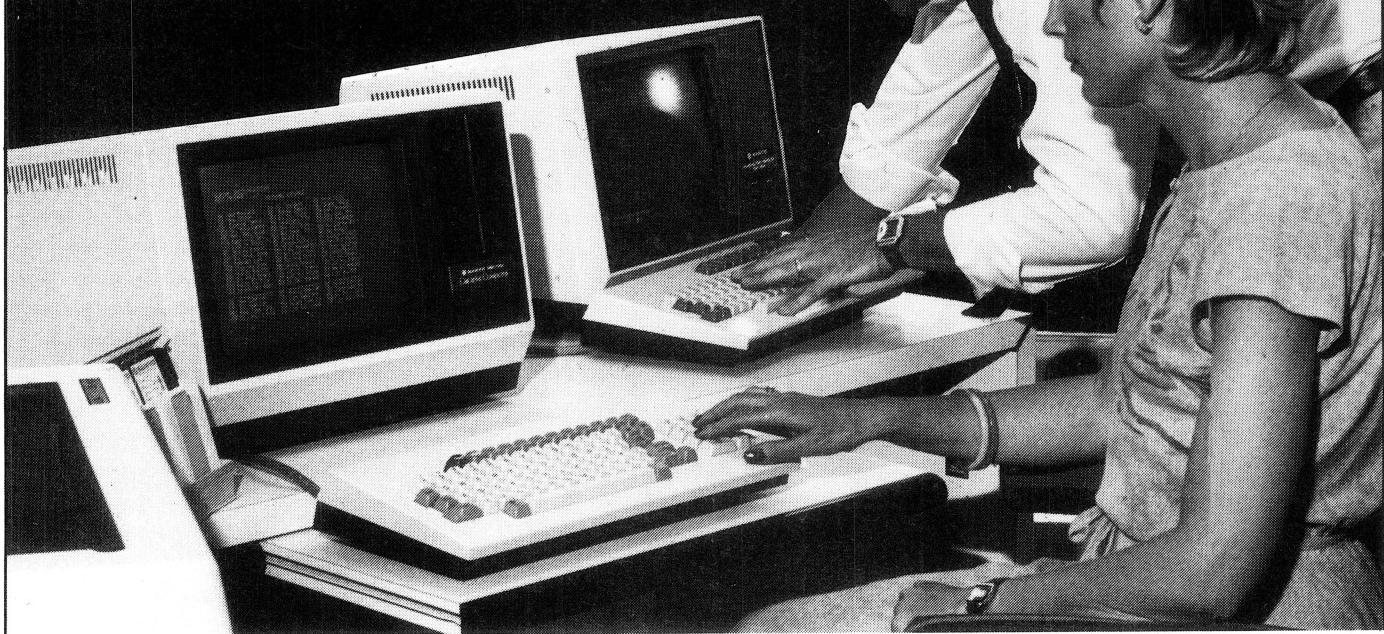
# VECTOR

## THE COMPANY COMPUTER.

DEALER ENQUIRIES INVITED

Dicker Data Projects Pty. Limited, 78 Captain Cook Drive, Caringbah, N.S.W. 2229. (02) 525 2122, 525 4707

# Sanyo's Software Solution



A NEW package from Sanyo must be amongst the best value around in small office systems.

For some months now, Sanyo has been selling the MBC-1000, a small business computer, at \$2990 including tax, complete with CP/M and Sanyo BASIC. With a single disk drive (320 Kbytes capacity under CP/M) and a Z-80 with 64 K RAM, the MBC-1000 can support the usual CP/M applications programs.

Additional disk drives are available (\$998), as well as hard disks ranging from 5 Mbytes to 20 Mbytes. However, the latest feature to be added to the machine gives it a unique advantage over competitors — multi-user operation.

The 'Sanyo System Solution' is a complete accounting package for small business which is rather different from most such packages. Written completely in assembly language, it incorporates its own multi-tasking operating system, allowing on-line enquiry and other operations from external terminals.

With the basic MBC-1000, with only one disk drive, it is possible to run an additional terminal with a restricted set of facilities — such as account enquiries — while the main console continues to run the full set of accounting programs.

With the addition of a second disk drive or a hard disk, up to 4 remote terminals can be supported, each able to perform

any function, although normally they would be dedicated to such tasks as order entry, and so on.

A number of modules are available, priced at up to \$400 approximately per module. There's the usual general ledger, debtors, creditors and inventory, as well as a letter-writing package with facilities well beyond the usual dunning letter generation, order entry with back-order facilities, supplier system, invoicing package and delivery address module.

The delivery address module automatically keeps track of orders placed by large companies which may have a central buying office but many delivery addresses.

As well as being multi-user, the system is also multi-tasking. In other words, once a job such as printing invoices is started, the user can detach it from the terminal and start doing something else. This feature alone is a major boon, as otherwise a computer can become a bottleneck in an otherwise efficient accounting system. Up to seven tasks can be handled concurrently.

A report generator allows dissections by product, by product group, by region, and so on. Similar selection facilities are available in the letter-writing module.

A particularly interesting capability of the system is its ability to recover elegantly from power outages. When the

system goes down, it attempts to write its status out to disk, and on powering up, will generally be able to take up at the point where it was interrupted. Approximately 80 percent success is attainable using minifloppies, while the hard disk, being faster, provides recovery from up to 95 percent of outages.

The software appears to be capable of running in a minimal system. For example, using a single minifloppy, the software can handle typically 200 debtors with up to 600 transactions per month, 500 products and 20 backorders. At the same time, it will support an additional terminal for on-line enquiries.

A two-floppy system can handle a lot more work, with more of the optional modules and much larger files. With a hard disk, quite large businesses could use the system.

Interestingly, the system was written in Australia, and to date, over 200 have been installed, so that it should be a fairly mature and stable package.

Considering the low cost of the hardware, and the high performance of the software, Sanyo's 'System Solution' should be a winner!

For further details, contact Sanyo Office Machines, 127 Walker Street, North Sydney 2060, or telephone (02) 929 4644. □

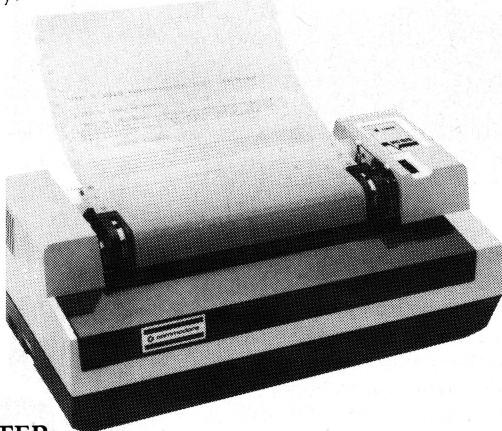
# How to make the best home computer in the world even better.

Peripherals to turn a powerful computer into a super-computer for the professional.

With the Commodore VIC 20 Computer, you have the finest home computer money can buy. And the more you use it, the more you will ask it to do.

Pretty soon, you'll want to extend VIC's vast potential to the full; and there is a wide range of VIC peripherals to help you do it.

Disk drives, disk-based software, a printer, cassette unit, joysticks, paddles — with these, VIC computing becomes total computing: giving you true professional power and capability.



## VIC PRINTER

The VIC Printer, like all VIC peripherals, offers a very high specification at a very competitive price.

It will print programs, letters, business data, graphic displays and so on.

Its main features include: 80 characters per line • Tractor feed dot matrix • 30 characters per second print speed • Full alphanumerics and graphic printing • Double-size character capability.

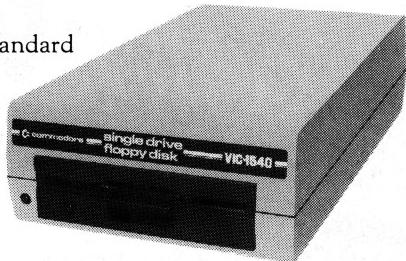
## VIC FLOPPY DISK UNIT

The VIC single-drive Disk Unit provides a fast, accurate and efficient means of storing and retrieving data and programs.

Together with the Printer, it transforms the VIC 20 into the ideal system for the small businessman or serious computer programmer.

Features include:

- 174,848 bytes capacity
- Uses soft-sectored standard 5 1/4" single density floppy disks
- Direct interface to VIC
- Direct compatibility with Printer
- Intelligent system independent of VIC.



## EXPANSION MEMORY CARTRIDGES

Special plug-in cartridges are available to expand VIC's memory. 3K, 8K and 16K RAM packs plug directly into the computer.

A Memory Expansion Board is also available to develop VIC's capabilities to the maximum.



## 1. Introduction to Basic

This package contains materials that will enable you to learn the fundamentals of programming in the BASIC computer language on your VIC 20 computer. It assumes no prior knowledge of computer programming and includes two cassettes containing 17 programs specially designed to accompany a comprehensive 152 page manual.



## 2. Programming Aids

To aid programmers to write their own programs, Super Expander, Machine Code Monitor and Programmers Aid cartridges are available.

## 3. Games

The VIC 20 has the largest selection of cartridge and cassette-based games available on any personal computer. VIC 20 games offer a real challenge and take a great deal of skill, time and mental agility to win.



## 4. Joysticks and Paddles

These accessories make playing games on the VIC even more enjoyable. The joystick has even more practical uses and can be used with high resolution graphics to draw pictures or help with graph plotting.

For full details of VIC 20, its peripherals and software, and a list of your local dealers, contact:  
The Commodore Information Centre,  
P.O. Box 336, Artarmon, N.S.W. 2064  
Tel: 437 6296



**C commodore**  
**VIC 20**

So much brain for so little.

MLVL 1613

# Quotation from Electronics

# "the best for a Computer"

## That's the brilliant Dick Smith SYSTEM 80 Blue Label

Try it for yourself . . . and see why Electronics Australia liked it so much! The new 'Blue Label' System 80 computer has even more features than before – and the best news of all, it actually costs less! Cat. X-4005

### Features:

- ★ 16K Memory (expandable to 48K with X-4020 Expansion Unit)
- ★ Full upper and lower case video display capacity
- ★ Built-in speaker
- ★ Built-in cassette deck with level control
- ★ Works with any standard TV set or monitor
- ★ Flashing Cursor
- ★ Huge range of software programmes  
AND SO MANY MORE FEATURES!!!

"Overall we are very impressed with the Blue Label System 80 . On a dollar per function basis it probably represents the best value around for a readybuilt computer. Other systems can be bought for less, but ultimately they are not as readily expandable as the System 80. There is also the matter of software, and here the System 80 really scores, with hundreds of compatible programs available for the TRS-80 as well as those specially written for the System 80."

Reprinted with the kind permission from.

ELECTRONICS AUSTRALIA June 1982

Huge range of software  
Compatible to most Tandy TRS 80 I programmes.

~~WAS~~  
~~\$750~~

**NOW**  
**\$699**

HCF  
\$21.88  
per week

## SORCERER DEMO

We are replacing our display stock and the Demo models must go! 'The famous Exidy Sorcerer computer comes with the industry standard Microsoft 8K BASIC, Z80 CPU based, 32K RAM, and many other features. It is the most powerful flexible and business like machine in its class'.

- ★ Latest Model, not superseded.
- ★ Full new computer warranty.
- ★ Demo & Store Models.
  - Some with imperceptible case marks.
- ★ ACT QUICKLY AND YOU'LL REAP THE BENEFIT!

**SALE**

**SAVE OVER  
\$440!  
\$950**

~~WAS  
\$1395~~

**ONLY  
\$950  
FULLY GUARANTEED!**

HCF  
\$16.24  
per week

Cat. X-3002

BE QUICK –  
ONLY A FEW AT THIS PRICE!

# Australia, June 1982

# value around ready built



FINANCE AVAILABLE ON SELECTED  
ITEMS TO APPROVED CUSTOMERS.  
ALL PRICES QUOTED ARE TAKEN PER  
WEEK OVER A 12 MONTH PERIOD.



## COLOUR COMPUTER UNDER \$400!

### VIC 20



## DATSON STANZA DRAWN THIS MONTH!

Hurry! It could be your last chance to win a great Datsun Stanza. All you have to do is purchase a System 80, Sorcerer or VIC 20 and fill in the entry coupon supplied. It's that simple! Good luck!

Definitely  
Closes  
this  
Month!



ONLY  
**\$399**

7 DAY TRIAL OFFER

If you're not completely happy, you can return your computer within 7 days in original condition and packing for a full refund. You owe nothing — not even an explanation!

INC IN NSW



## DICK SMITH Electronics

NSW 6 Bridge St SYDNEY 27 5051 • 125 York St SYDNEY 290 3377 • 145 Parramatta Rd AUBURN 648 0558 • T55 Terrace Level BANKSTOWN SQ. 707 4888 • 613 Princes Hwy BLAKEHURST 546 7744 • 552 Oxford St BONDI JUNCTION 387 1444 • 818 George St BROADWAY 211 3777 • 531 Pittwater Rd BROOKVALE 93 0441 • 147 Hume Hwy CHULLORA 642 8922 • 162 Pacific Hwy GORE HILL 439 5311 • 396 Lane Cove Rd NORTH RYDE 888 3200 • cnr Smith & George Sts PARRAMATTA • 173 Maitland Rd NEWCASTLE 61 1896 • 263 Keira St WOLLONGONG 28 3800 • Tamworth Arcade & Kable Ave TAMWORTH 66 1961 ACT 96 Gladstone St FYSHWICK 80 4944 VIC 399 Lonsdale St MELBOURNE 67 9834 • 260 Sydney Rd COBURG 383 4455 • 656 Brige Rd RICHMOND 428 1614 • cnr Springvale & Dandenong Rds SPRINGVALE 547 0522 • cnr Ross Smith Ave & Nepean Hwy FRANKSTON 781 9144 • 205 Melbourne Rd GEELONG 78 6766 QLD 293 Adelaide St BRISBANE 229 9377 • 166 Logan Rd BURANDA 391 6233 • 842 Gympie Rd CHERMSIDE 59 6255 SA 60 Wright St ADELAIDE 212 1962 • 435 Main North Rd ENFIELD 261 6088 • cnr Main South & Flagstaff Rds DARLINGTON 298 8977 WA 14 William St PERTH 328 6944 • cnr Wharf St & Albany Hwy CANNINGTON 451 8666 TAS 25 Barrack St HOBART 31 0800

MAIL ORDER CENTRE: PO Box 321, North Ryde NSW, 2113. Phone: (02) 888 3200

DSE/A379/JW

# your computer pocket programs

## APPLE

### Apple Screen-Width Formatter

By Chris Cotterill

THE IDEA of this program is to aid in Applesoft programming, where editing of PRINT statements is required.

AppleSoft 'chops' up strings, when it formats LISTings of PRINT statements on a 40-character screen. Location 33 (\$21), holds the screen-width, and POKEing it with decimal 33 (character spaces), will defeat this chopping up of LISTed PRINT statements. An Applesoft program is used to load a machine program. The machine code can then be accessed by means of the & (ampersand), the screen-width will toggle between 40 and 33 character spaces.

Just as Applesoft will recognise the ? as a token for PRINT (in the right syntactical context), so ROM Applesoft 'sees' the & as a CALL to decimal location 1013 (CALL 1013). Location 1013 (\$035F), may hold a jump to any other location. I have used the area at decimal 768 (\$0300), so DOS must be booted first.

```

1 REM *****
2 REM *APPLE SCREEN-WIDTH FORMATTER*
3 REM * BY CHRIS COTTERILL ... *
4 REM *****
5 REM ### JUMP TO DECIMAL 768 ### :-
6 :
10 POKE 1013,76: POKE 1014,0: POKE 1015,3
11 :
15 REM SCREEN-WIDTH FORMATTER :-
16 :
20 FOR LOC = 768 TO 783
25 READ BYTE: POKE LOC,BYTE
30 NEXT LOC
31 :
50 DATA 165,33,201,33,240,5,169,33
60 DATA 133,33,96,169,40,133,33,96
70 NEW

```

Once RUN, this screen-width formatter erases itself at line 70,

though 70 DEL1,70 could be used instead of NEW. Then all that has to be done is to LOAD your own Applesoft program and continue work on it.

Each time you enter the & (in direct or programmed mode), the screen-width will toggle.

ESCAPE codes can then be used to position the cursor for editing. Potential users should note that:

- When going from a 40-character to a 33-character screen, some of your VDU display may get frozen at the right-hand side. This effect will be defeated when toggling back to a 40-character screen.

- The 'screen-width formatter' program is intended to be added to the HELLO program of a disk set aside for the writing of other software, which may need lots of editing. The HELLO program could also contain a CATALOG, and a request for which Applesoft program to LOAD.

but it is re-enabled by adding the lines:

```
35 REM RE-ENABLE & TOKEN
40 POKE 2142,244: POKE
2143,3
```

APPENDIX : SUMMARY OF MACHINE CODE PROGRAM :-

| LOCATION<br>(DEC.) (HEX.) | BYTE<br>(DEC.) (HEX.) | ASSEMBLY<br>SUMMARY :                 |
|---------------------------|-----------------------|---------------------------------------|
| 1013 035F                 | 76 4C                 | JMP \$0300 : jump to dec loc 768      |
| 1014 0360                 | 00 00                 |                                       |
| 1015 0361                 | 3 03                  |                                       |
| 768 0300                  | 165 A5                | LDA \$21 ; load accum from dec loc 33 |
| 769 0301                  | 33 21                 | CMP #\$21 ; compare to dec #33        |
| 770 0302                  | 201 C9                |                                       |
| 771 0303                  | 33 21                 |                                       |
| 772 0304                  | 240 F0                | BEQ #\$05 ; branch fwd 5 if equal     |
| 773 0305                  | 5 05                  |                                       |
| 774 0306                  | 169 A9                | LDA #\$21 ; load accum with dec #33   |
| 775 0307                  | 33 21                 |                                       |
| 776 0308                  | 133 85                | STA \$21 ; store in dec loc 33        |
| 777 0309                  | 33 21                 |                                       |
| 778 030A                  | 96 60                 | RTS ; return to source                |
| 779 030B                  | 169 A9                | LDA #\$28 ; load accum with dec #40   |
| 780 030C                  | 40 28                 |                                       |
| 781 030D                  | 133 85                | STA \$21 ; store in dec loc 33        |
| 782 030E                  | 33 21                 |                                       |
| 783 030F                  | 96 60                 | RTS ; return to source.               |

### Geometric Graphics

By Ian Chia

I'D LIKE your Apple column more if it had some tips, hints and so on. I realise this might be difficult since no one is submitting them. Therefore, I will start it off.

For people trying to write games in high-res, they might use page flipping. This is accomplished by drawing on page one while displaying two, then drawing on two while displaying one, and so on.

This can be easily done by:

```

POKE -16304,0      (display graphics)
POKE -16297,0      (display hi-res)
POKE -16299,0      (display page two)
POKE 230,32         (draw on page one)
DRAW 1 AT 139,79    (draw shape)
POKE -16300,0      (display page one)
POKE 230,64         (draw on page two)
DRAW 1 AT 140,79    (draw shape)
POKE -16299,0      (display page two)
POKE 230,32         (draw on page one)
XDRAW 1 AT 139,79   (erase shape)
DRAW 1 AT 141,79    (draw new shape slightly over horizontally)
POKE -16300,0      (display page 1 etc....)

```

Also when BLOADing a file, its length can be determined by: PRINT PEEK (43616) + PEEK(43617)\*256 and its starting address can be found by: PRINT PEEK (43634) + PEEK(43635)\*256.

Finally, enclosed is a program that might be pleasing to those who like geometric graphics with interesting colour combinations.

```

10 REM ****
20 REM *
30 REM * COLOR *
35 REM *
40 REM * DIAMOND *
50 REM *
60 REM * BY *
65 REM *
70 REM * IAN CHIA *
80 REM *
90 REM * 14 JUNE, 1982 *
95 REM *
96 REM ****
97 :
100 POKE 3072,1: POKE 3073,0: POKE 3074,4: POKE 3075,0: POKE 3076,40:
    POKE 3077,54: POKE 3078,63: POKE 3079,36: POKE 3080,5: POKE 232,0:
    POKE 233,12: POKE 3081,0
110 INC1 = INT (5 * RND (1))
120 IEC2 = INT (10 * RND (1))
130 IF INC1 = 0 OR IEC2 = 0 THEN 110
140 IF INC1 = IEC2 THEN 110
150 HGR2
160 HCOL = INT (7 * RND (1)): IF HCOL = 4 OR HCOL = 0 THEN 160
165 HCOLOR= HCOL
170 FOR I = 1 TO 65 STEP INC1
180 SCALE= I: ROT= 8
190 DRAW 1 AT 140,94
200 NEXT
205 HCOL = INT (7 * RND (1)): IF HCOL = 4 OR HCOL = 0 THEN 205
210 HCOLOR= HCOL
210 FOR I = 65 TO INC1 + 10 STEP - IEC2
220 SCALE= I: ROT= 0
230 XDRAW 1 AT 140,94
240 NEXT
250 FOR I = 0 TO 750: NEXT
260 GOTO 110
52 HOME
54 HIMEM: 21900
56 FOR I = 21900 TO 21925
58 READ C: POKE I,C: NEXT
59 POKE 232,21900 - INT (21900 / 256) * 256: POKE 233, INT (21900 / 256)
62 DATA 1,0,4,0,27,63,7,73,9,8,24,36,4,146,18,9,45,5,27,27,26,2,54,6,0,0
    ,0,0
64 HGR
66 SCALE= 3: ROT= 0
68 DIM STARI(2,2)
70 FOR I = 1 TO 8: STARI,I,1) = INT (RND (12) * 270 + 10): STARI,I,2) = INT
    (RND (12) * 140 + 10): NEXT : REM SET POSITIONS OF STARS
72 FUEL = 2000
74 GOTO 100
100 REM MAIN LOOP
110 ROT= 0
120 SCALE= 3
130 HCOLOR= 3
140 FOR JJ = 1 TO 8
150 FUEL = FUEL - 5: HOME : UTAB 22: PRINT SPC(20)"FUEL": FUEL
158 IF FUEL = 0 THEN TEXT : PRINT "SCORE "; SC: END
170 IF X < 20 THEN X = 20
180 IF X > 250 THEN X = 250
188 IF Y < 20 THEN Y = 20
198 IF Y > 139 THEN Y = 139
208 IF Y > 139 THEN Y = 139
218 HCOLOR= 3: HPLOT 140,80 TO 145,80 TO 140,85 TO 135,80 TO 140,75 TO 14
    5,80: REM TARGET
228 DRAW 1 AT X,Y
238 OX = X:OY = Y
248 B = ( PDL (8) - 120) / 25
258 X = X + B
268 Z = ( PDL (1) - 120) / 30
278 Y = Y + Z
288 XDRAW 1 AT (OX),OY
298 IF PEEK (- 16287) > 127 OR PEEK (- 16286) > 127 THEN 500
295 REM STARS
308 HCOLOR= 4
318 HPLOT STARI,JJ,1),STARI,JJ,2)
328 HCOLOR= 3
338 HPLOT STARI,JJ,1),STARI,JJ,2)
348 HCOLOR= 1
358 NEXT JJ: GOTO 130
495 REM LASERS FIRED
508 DRAW 1 AT X,Y: GOSUB 1000
518 IF UX > 135 AND UX < 145 AND OY > 75 AND OY < 85 THEN SC = SC + 10: HCOLOR=
    5: HPLOT 140,80: CALL 62454
520 HCOLOR= 4: HPLOT 140,80: CALL 62454
530 HCOLOR= 3: HPLOT 140,80 TO 145,80 TO 140,85 TO 135,80 TO 140,75 TO 14
    5,80
540 FOR I = 1 TO 8: HPLOT STARI,I,1),STARI,I,2): NEXT
558 X = INT (RND (12) * 280 + 10): Y = INT (RND (12) * 210 + 10)
568 GOTO 100
1000 REM LASERS
1010 XT = 279 - X:YT = 159 - Y
1020 S = - 18336: HCOLOR= 1
1030 FOR I = 2 TO 4 STEP 2
1040 HPLOT 279,159 TO X + 3 * XT / 4, Y + 3 * YT / 4: HPLOT 0,159 TO X - 3
    * XT / 4, Y + 3 * YT / 4
1050 POK 0,250: CALL 768
1058 HPLOT X + 3 * XT / 4, Y + 3 * YT / 4 TO X + 2 * XT / 4, Y + 2 * YT / 4
    : HPLOT X - 3 * XT / 4, Y + 3 * YT / 4 TO X - 2 * XT / 4, Y + 2 * YT / 4
1070 POK 0,280: CALL 768
1080 HPLOT X + 2 * XT / 4, Y + 2 * YT / 4 TO X + 1 * XT / 4, Y + 1 * YT / 4
    : HPLOT X - 2 * XT / 4, Y + 2 * YT / 4 TO X - 1 * XT / 4, Y + 1 * YT / 4
1090 POK 0,170: CALL 768
1100 HPLOT X + 1 * XT / 4, Y + 1 * YT / 4 TO X,Y: HPLOT X - 1 * XT / 4, Y +
    1 * YT / 4 TO X,Y
1110 POK 0,130: CALL 288
1120 HCOLOR= 5: NEXT I
1130 RETURN
7999 REM SOUND ROUTINE
8000 POK 768,169: POK 769,8: POK 770,133: POK 771,1: POK 772,234: POK
    773,234: POK 774,234: POK 775,173: POK 776,48:
8001 POK 777,192: POK 778,136: POK 779,208: POK 780,4: POK 781,198: POK
    782,1: POK 783,246: POK 784,8: POK 785,202:
8002 POK 786,208: POK 787,246: POK 788,166: POK 789,0: POK 790,76: POK
    791,7: POK 792,3: POK 793,96: POK 794,208:
8010 RETURN

```

## Apple Space War

By M J Smith

HERE IS a short program I have been writing for the last two months. It is a game in which the player steers, by the use of paddles or joystick, a gun sight around the screen, trying to hit a small target in the centre. There is a time limit of 2000 units of fuel, giving about three minutes of play.

The program is written in Applesoft II BASIC, on a 48K system. I wrote the game for the use of paddles, with both buttons firing the lasers. The game would

probably be easier to play with a joystick, but you might have to change lines 250 and 270 to get the directions right.

When I first wrote the program, I used the keys A, Z for up and down and the arrows for left and right, reading them through PEEK statements. For some reason this didn't work very well, as I kept receiving OUT OF MEMORY errors, which I couldn't stop. So I converted it to PDL(0) for left/right, and PDL(1) for up/down. □

10 GOSUB 8000
50 REM \*\*>== SPACE WAR ==<<\*\*

### Texas Instruments Home Computer TI-99/4A

Programming

You don't have to be a computer expert to use our Home Computer. TI BASIC programming is designed for skilled computer users and beginners alike. The built-in TI BASIC language makes the Home Computer a valuable desktop instruction tool at home or at the office. It's also a great way to introduce your children to programming computers.



TEXAS INSTRUMENTS  
INCORPORATED

16 Bit Colour Home Computer \$499. Plus Chess, Adventure  
T.I. Invaders

COMPUTER SYSTEM SPECIALISTS  
Computer Focus

4/224 George Street, Liverpool (021) 600 8222

NOW AVAILABLE AT LIVERPOOL

**ATARI®**

Models 400 & 800 plus accessories.  
Home Computer Systems with TV connection.  
16 Colours + 16 Intensities.

**ZX81**  
**sindair**

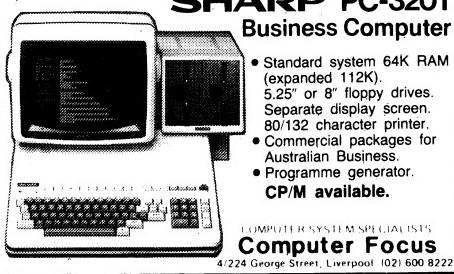
The low cost basic small home computer.  
Black & White - Function Keys - Std. TV connection.

COMPUTER SYSTEM SPECIALISTS  
Computer Focus

4/224 George Street, Liverpool (021) 600 8222

Sharp business computers. Let the name you know pave your way.

### SHARP PC-3201 Business Computer



- Standard system 64K RAM (expanded 112K).
- 5.25" or 8" floppy drives.
- Separate display screen.
- 80/132 character printer.
- Commercial packages for Australian Business.
- Programme generator.
- CP/M available.

COMPUTER SYSTEM SPECIALISTS  
Computer Focus

4/224 George Street, Liverpool (021) 600 8222

## Display Inversion

By Benjamin Smith

ONE problem I have encountered when using my ZX81 is in the output of inverse video (white-on-black) characters.

Although the Sinclair offers keyboard access to these, they can only be directly applied to character strings created by or contained within the program,

and not to those input during program execution, or numbers.

To solve this problem, I proceeded to write the following Z-80 machine code routine which will invert all characters in the display from the next PRINT position to the end of the display file.

```
FIND.DISPLAY 2A 0E 40 LD HL, (16398) ;Load first address for
                                         inversion into HL
ED 5B 10 40 LD DE, (16400) ;Last address of display+1
                                         into DE
CHECK.NEWLINE 3B 75 LD A, i17 ;Code of NEWLINE - 1
3C INC A ;Necessary if routine is
           stored in a REM.
BE CP (HL) ;End of line in display?
28 04 JR Z, NEXT.ADDR ;Yes, so don't invert
3E 80 LD A, 128 ;Inversion displacement
86 ADD A, (HL) ;Invert
77 LD (HL), A ;Back into display file
NEXT.ADDR 23 INC HL ;Next address of display
A7 AND A ;Clear CY flag for SBC
ED 52 SBC HL, DE ;Compare by subtraction.
               End of display reached?
D0 RET NC ;Yes, so return to BASIC
19 ADD HL, DE ;Else restore HL
18 EE JR CHECK.NEWLINE ;And repeat for next
               character.
```

To get the routine into RAM, enter and RUN the following BASIC program. Once it has been executed, line 10 will contain the machine code, so lines 20 through 60 may be deleted (by typing just the line numbers, followed by NEWLINE).

```
10 REM .....
20 LET C$ = "2A0E40ED5B10403E753CBE28043E80867723
          A7ED52D01918EE*"
30 FOR A = 16514 TO 16538
40 POKE A, (CODE C$ - 28)*16 + CODE C$ (2) - 28
50 LET C$ = C$ (3 TO )
60 NEXT A
```

You may wish to save the routine on tape. If so, do so now, then enter the following lines to test it:

```
20 FOR I = 11 TO 21
30 PRINT AT I, 31
40 NEXT I
50 PRINT AT 11, 0;
60 LET X = USR 16514
70 LET X = RND ** RND
80 GOTO 60
```

(where r1 is the row, and c1 is the column of the position after the last one to be inverted)

(where r1 is the row, and c1 is the column of the position after the last one to be inverted).

Note that line 10 (containing the machine code routine) must always be the first line of the BASIC program, and must not be altered. 16514 is the address of the character immediately after the keyword in the first line of BASIC, and it is this address that USR calls in the sequence of instructions above.

## TRS80

### Pocket Word Processor

By S Corrigan

THIS IS a word file processing program I recently developed for my Sharp PC-1211 pocket computer (the program will also run on a Tandy TRS-80 equivalent).

I believe other pocket computer users may find it to be of interest.

(*Mr Corrigan's program came complete with lengthy, well-presented documentation. Unfortunately, we don't have space to include it here, but will provide a copy to anyone who sends us a stamped, addressed A4 envelope —Ed.*)

```
(line #) PRINT AT r, c;
(line #) LET X = USR 16514
(where r is the row, and c is
the column at which inversion
is to begin)
```

(where r is the row, and c is the column at which inversion is to begin).

To invert from a certain position to another, add the following lines to the above:

```
(line #) PRINT AT r1, c1;
(line #) LET X = USR 16514
```

```
10: " " :PAUSE "F
      ILE PROC. 20
      /01/82"
20: "E":B=5:BEEP
3:PAUSE "STA
RT"
30:BEEP 2:INPUT
      "COMMAND?";C
      $
40:IF C$="DE"
      THEN "D"
50:IF C$="WR"
      THEN "O"
60:IF C$="FI"
```

# TRS80

```

THEN "F"
70: IF C$="PR"
THEN "P"
80: IF C$="SA"
THEN "T"
90: IF C$="LO"
THEN "L"
100: IF C$="LI"
THEN "N"
110: IF C$="RE"
THEN "E"
120: IF C$="IN"
THEN "I"
130: BEEP 4:PAUSE
"ERROR":GOTO
30
145: "O":BEEP 1
150: INPUT D$:IF
D$="WRITFIN"
THEN 30
160: A$(B)=D$:IF
D$="**"THEN
30
170: B=B+1:IF B<8
1THEN 150
180: A$(B)="**":GOSUB "W":BEEP 4:PAUSE
"CONTINUE":GOTO "O"
190: "F":BEEP 1:INPUT "WHAT?":D$:
210: IF A$(B)=D$:
BEEP 3:PRINT "FOUND ";A$(B):GOTO 30
220: B=B+1:IF A$(B)="**":GOSUB "R"
225: GOTO 210
230: "P":D=0:A=B-
4:BEEP 1:INPUT "HOW M
30
ANY?":C
232: PRINT A$.."":A$(B)
233: IF A$(B)=="**"
"THEN 30
234: D=D+1:B=B+1:
A=A+1:IF D=C
THEN 30
236: GOTO 232
240: "N":A=0:B=4
250: B=B+1:A=A+1:
PRINT A$.."":A$(B)
260: IF A$(B)=="**"
"LET B=5:GOTO 30
270: GOTO 250
280: "T":GOSUB "W
":GOTO 30
290: "L":GOSUB "R
":GOTO 30
310: "W":BEEP 5:
PAUSE "SAVIN
G"
320: PRINT #FILE
";A$(5)
330: B=5:RETURN
340: "R":BEEP 5:
PRINT "LOADI
NG"
350: INPUT #FILE
";A(5)
360: B=5:RETURN
370: "I":BEEP 1:
INPUT "HOW M
ANY?":C
375: D=5
380: IF A$(D)=="**"
"THEN 390
385: D=D+1:GOTO 3
80
390: A=81-D
392: IF C>=ABEEP
5:PAUSE "NO
SPACE":GOTO
30
395: A=D:D=D+C
400: A$(D)=A$(A)
410: D=D-1:A=A-1
420: IF A>BTHEN 4
OO
430: BEEP 4:PRINT
"AFTER ";A$(B):PRINT
"IN
SERT ";C:B=B
+1
440: GOTO 30
450: "I":A=B
455: A$(B)=A$(B+1
)
460: IF A$(B)=="**"
"LET B=A:
BEEP 4:PAUSE
"DELETED":
GOTO 30
470: B=B+1:GOTO 4
55

```

## BYTEWRITER

### DAISY WHEEL PRINTER LETTER QUALITY PRINTER AND TYPEWRITER IN ONE PACKAGE

The BYTEWRITER is a new Olivetti Praxis 30 electronic typewriter with a micro-processor controlled driver added internally.

**\$895**  
plus shipping

Dealer  
Inquiries  
Invited



#### FEATURES

- Underlining • 10, 12, or 15 characters per inch switch selectable • 2nd keyboard with foreign grammar symbols switch selectable • Changeable type daisy wheel • Centronics-compatible parallel input operates with TRS-80, Apple, Osborne, IBM and others • Cartridge ribbon • Typewriter operation with nothing to disconnect • Service from any Olivetti dealer • Self test program built in.

## BYTEWRITER

CONTACT: COMPUTER EDGE PTY. LTD.,  
364 FERRARS STREET, ALBERT PARK 3206  
Telephone: (03) 690 1477

Praxis 30 is a trademark of Olivetti Corp  
TRS-80 is a trademark of Tandy Corp  
BYTEWRITER is a trademark of Williams Laboratories

AUSTRALIAN BEGINNING IDENTIFICATION No. SUSSFREECAUL

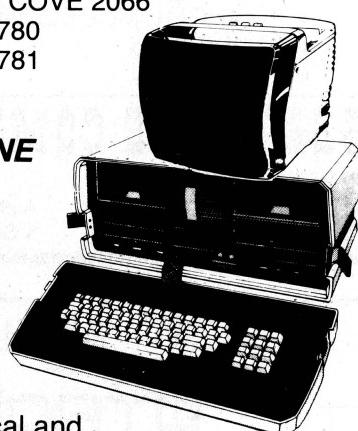


### NEW GENERATION COMPUTER STORE

93 LONGUEVILLE ROAD  
LAND COVE 2066  
427 4780  
427 4781

### BUY AN OSBORNE GET GREEN SCREEN FREE

OFFER EXPIRES  
DEC 31 1982



Fully trained technical and software support personnel for on site service.

**OSBORNE**  
COMPUTER CORPORATION

**HITACHI**

**sirius 1**  
COMPUTER

**APPLE SYSTEMS  
SUPPORT**



OPEN TO OUR CUSTOMERS FOR  
SERVICE & PROGRAMMING SUPPORT  
*It's what our business is based on.*

ASK ABOUT  
12 MONTH  
WARRANTY  
COVERAGE

# **COMMODORE**

# **Commodore Maxe-Maze**

**By Adam Smith**

THIS program, called 'Maxe-Maze' is a completely original game program compiled by me which I thought might be of interest to other Commodore CBM/Pet users.

The program sets up a series of mazes, each one slightly harder than the previous one. To move the man the numerical keypad is used:

- 6 — moves the man right
- 4 — moves the man left
- 8 — up 2 — down

The '5' key lets off a bomb clearing an area around you, use

READY.

```
2 REM ** MAKE-MAZE FOR COMMODORE CBM/PET, 2.232 K NEEDED **
3 REM ** BY R.SMITH    **
4 X=7.5
12 PRINT"MM"
```

# THE PROFESSIONALS

## COMPUTERS FOR

- SCIENTIFIC
  - COMMUNICATIONS
  - ENGINEERING
  - FINANCIAL MODELLING
  - BUSINESS &
  - EDUCATION

# **SEAHORSE COMPUTERS**

Authorised **apple** Dealer  
& Service Centre No 88X061

10 MITCHELL ST,  
CAMDEN, NSW 2570.  
TELEPHONE (046) 66-6406

TELEPHONE (046) 66-6406

NOW AVAILABLE

# The **OTRONA**<sup>TM</sup> 512 Portable Computer

ALSO

# S100 SYSTEMS AND COMPONENTS MICRO SERVICE CENTRE

C.A.E. ELECTRONICS PTY LTD

1/27 FORGE STREET BLACKTOWN 2148  
Telephone (02) 6214242

```

20 PRINT"
30 PRINT"
40 PRINT"
50 PRINT"
60 PRINT"
63 PRINT:PRINT "
64 PRINT
65 PRINT,"BY- ADAM.N.SMITH.":PRINT:PRINT
66 PRINT" YOUR MISSION IS TO TRAVEL THROUGH THE"
67 PRINT" MAZE, SAVING ALL THE STRANDED PEOPLE."
68 PRINT" THEN CONTINUE TO THE END OF THE MAZE."
69 PRINT" BUT BE CAREFUL, A TIME BOMB IS DUE"
70 PRINT" TO EXPLODE, IF YOU DO NOT ESCAPE IN"
71 PRINT" TIME YOU AND YOUR PEOPLE WILL BE"
72 PRINT" KILLED. # GOOD LUCK #":PRINT:PRINT,"TO PLAY HIT ANY KEY":PRINT
73 FOR G=1TO4000:GETV$:IFV$="":THEN GOTO 80
75 NEXT G
78 FOR V=1TO5:G0=0:PRINT" ** PROGRESSIVE SCORE=";SC;" **"
81 X=-X-.55:SY+=200:SC=SC+4000-(10*V)
82 READ BA,FO,ME,YO,HQ
84 FORF=1TO1000:POKE32767+F,BA:NEXTF
86 FURF=1TO55:POKEINT(RND(1)*919)+32808,HQ:NEXTF
92 FOR F=1TO20:POKE INT(RND(1)*920)+32807,ME:NEXTF
94 =32809:T=0:FOR ID=32768TO32768 STEP 48:POKEID,BA:POKEID+39,BA:NEXTD
95 POKE 32809,8:POKE 32810,15:POKE 32811,13:POKE 32812,5
96 POKE 32724,5:POKE 32725,14:POKE 32726,4
107 GET B:T=T+1:POKE A,FO
113 IF B=5 AND G0<3 THEN GOTO 5020
114 IF T>360 THEN POKE 32785,91
115 IF BC>6 AND BC<8 AND BC>2 AND BC<4 THEN BC=
125 K=PEEK(A+1):IF B=6 AND K=M THEN SC=SC+1000
130 IF B=6 AND K>BA THEN A=A+1
135 K=PEEK(A-1):IF B=4 AND K=ME THEN SC=SC+1000
140 IF B=6 AND K>BA THEN A=A-1
145 K=PEEK(A-40):IF B=8 AND K=ME THEN SC=SC+1000
150 IF B=8 AND K>BA THEN A=A-40
155 K=PEEK(A+40):IF B=2 AND K=ME THEN SC=SC+1000
160 IF B=2 AND K>BA THEN A=A+40
180 C=B:POKE A,YO
195 IF A=32726 THEN NEXT YY
196 IF A=32726 THEN 2960
197 IF T=400 THEN 2010
198 IF T>360 THEN POKE 32785,86
210 IF R=32852 AND R=32684 THEN GOTO 187
250 GOTO 95
260 FOR F=1TO400 :POKE 32768+INT(RND(1)*1000),INT(RND(1)*255):NEXT F
262 FOR BG=1TO20
2630 PRINT"   *****  NEW  *****"
2631 PRINT"   *  *  *  *  *  *  *  *  *  "
2632 PRINT"   *  *  *  *  *  *  *  *  *  "
2633 PRINT"   *  *  *  *  *  *  *  *  *  "
2634 PRINT"   *  *  *  *  *  *  *  *  *  "
2635 PRINT"
2637 NEXT BG
2640 FOR F=1 TO 2000:NEXTF
2680 GOTO 3010
2690 SC=SC+2000+4000-T*10
2610 PRINT"0"
2620 PRINT"      HIGH SCORE=";HS;" ";J$
2625 PRINT"      ";"RESTORE"
2630 PRINT"      YOUR SCORE=";SC
2635 IF SC>HS THEN 3620
2640 PRINT"*** YOU DIED HIGH SCORE ***"
2650 PRINT"YOUR NAME" INPUT J$:HS=SC
2660 M=1:PRINT"ANOTHER GO ?"
2670 INPUT V$:
2680 SC=0
2990 IF V$="N" THEN END
4000 PRINT"1":GO TO 10
5000 DATA 150,96,42,81,96,160,96,42,87,154,96,160,42,81,160,
160,102,42,87,102
5010 DATA 101,100,160,102,42,36
5020 PUKE P=41:HQ:POKE A=40,HQ:POKE 3=19,HQ:POKE 4=19,HQ
5030 PUKE P+1,HQ:PUKE A+39,HQ:POKE m=49,HQ:POKE 4=-1,HQ
5040 GC=CG+1:SC=SC+400
5050 DATA 255,255,255,255

```



**FROM YOUR LOCAL  DEALER**

Speed, accuracy and reliability are what count when it comes to processing words.

The new NEC 7700 Spinwriters<sup>™</sup> are built for computer users who require continuous operation at high speed.

New to Australia, thousands of these machines have been proven in Japan and the U.S.A., where user experience shows an average continuous operational life of 2,500 hours before the likelihood of machine failure.

Even when that happens, the NEC system is so simple that the average repair time is just 30 minutes, and off you go again.

#### THE TECHNOLOGICAL EDGE THAT MAKES A LEADER.

These NEC Spinwriters<sup>™</sup> are micro-processor-controlled impact printers. Their work is original letter quality, as typed by your favourite personal secretary.

The lightweight plastic thimble at the heart of the printer carries as many as 128 characters, 25% more than conventional daisy wheels, and comes in over 70 typefaces. Thimbles can carry two typefaces and can even print in two

dissimilar languages — say Greek and English. The standard spacing is 10 or 12 characters per inch. They print 136 columns at 10 characters per inch or 163 columns at 12 characters per inch.

Impressive enough specifications, but the real breakthrough is that the Spinwriter<sup>™</sup> prints at a maximum speed of 55 characters per second, more than 25% faster than the current market leader. That kind of edge in speed is the difference between champions and also-rans.

#### WE MAKE WHAT WE SELL, AND SELL WHAT WE MAKE.

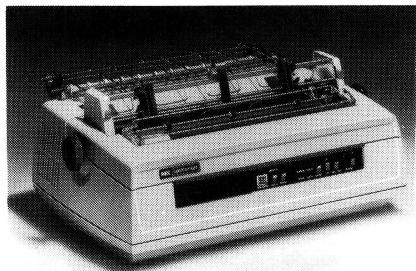
The design, specification and manufacture of these Spinwriters<sup>™</sup> is undertaken by NEC in Japan. And it is NEC Information Systems Australia that imports, distributes and services the machines. The same company with the same high standards of design, manufacture, sales and service.

NEC Spinwriters<sup>™</sup> achieve their impressive performance and reliability because matchless NEC components are matched to a printing mechanism which is over-engineered; it operates well inside its physical capacity. This allows continuous operation under excess-

sively heavy workloads and the maintenance of letter quality at all times.

#### INTEGRATE OR DIE.

The NEC Spinwriter<sup>™</sup> is available with a multitude of interfaces, both parallel and serial. That means there is almost certainly a Spinwriter<sup>™</sup> model to suit the computer you use now or are thinking of buying.



**NEC**  
TOKYO JAPAN  
**spinwriter**<sup>™</sup>

## HOW TO MAKE UP FOR THE 35 HOUR WEEK.



THIS THIMBLE WILL PRINT OUT THE 1981 ANNUAL REPORTS OF THE TOP 20 COMPANIES IN 22 HOURS 12 MINUTES, 5 HOURS FASTER THAN THE CURRENT MARKET LEADER.

NEC Information Systems Australia Pty. Ltd.

99 Nicholson Street, St. Leonards, N.S.W. 2065. Tel: (02) 438 3544

11 Queens Road, Melbourne, Vic. 3004. Tel: (03) 267 5599

SILVER NEC 513

# VICSOFT

Over 200 Cassettes available  
**NOW FOR VIC 20 COMPUTERS**  
from only \$**14.00** each

| Ref<br>No. | Title             | Ref<br>No. | Title             | Ref<br>No. | Title                   |
|------------|-------------------|------------|-------------------|------------|-------------------------|
| 001        | DIG & BURY        | 020        | EUREKA STOCKADE   | 106        | SKIER                   |
| 002        | U.F.O. SHOOTING   | 021        | LUNAR LANDER      | 107        | SIMPLE SIMON            |
| 003        | SUB-ATTACK        | 022        | ROCKET COMMAND    | 108        | TANK WARS               |
| 004        | MOORSE            | 023        | CITY BOMBER       | 109        | VICTREK (8K)            |
| 005        | RAINBOW           | 024        | MINEFIELD         | 110        | FUEL PIRATES            |
| 006        | CRAZY BALLOON     | 025        | HANGMAN           | 111        | PAK BOMBER              |
| 007        | MOLE ATTACK       | 026        | PACKMAN           | 112        | LASER BLITZ             |
| 008        | SUBMARINE         | 027        | SUPERLANDER       | 201        | HOUSEHOLD FINANCE 1 & 2 |
| 009        | NAVAL BATTLE      | 028        | TARGET            | 202        | HOUSEHOLD FINANCE 3 & 4 |
| 010        | FIRE TREK         | 029        | MAZE              | 203        | VIC TRAP                |
| 011        | TREASURE CARRY IN | 030        | PIANO/DRAGON      | 204        | SEAWOLF                 |
| 012        | HEAD ON           | 031        | SOUND EFFECTS     | 205        | BOUNCE OUT              |
| 013        | I.C.B. MISSION    | 032        | CHEQUE BALANCER   | 206        | MONSTER MAZE            |
| 014        | BALLOON BOMBER    | 036        | CHARACTER CREATOR | 207        | HOME INVENTORY          |
| 015        | TEN PIN BOWLS     | 101        | HESCOUNT          | 208        | MATHS HURDLER           |
| 016        | HI-RES. DEMO      | 102        | DRAGON MAZE       | 209        | LOAN ANALYSER           |
| 017        | VIC CUBE          | 103        | HESPLOT           | 210        | CODE MAKER              |
| 018        | MONSTER CHASE     | 104        | MAZE OF MIKOR     | 211        | CODE BREAKER            |
| 019        | LASER FIGHT       | 105        | PINBALL           | 212        | CAR COSTS               |

**NOW AVAILABLE** EDUCATIONAL PROGRAMS INCLUDING  
LANGUAGE TRAINING — VOCABULARY BUILDING  
ENGLISH SKILLS — ELEMENTARY MATHS

**WORD PROCESSOR NOW AVAILABLE  
RUNS ON 8K**

**Tear out this page now and send your order in to the following  
Distributors**

**WESTERN AUSTRALIA**

Victoria Park Computer Centre,  
38 Teddington St.,  
Victoria Park  
(09) 361-1355.

**S.A., N.T., VIC., TAS.**

Computer Imports Colour  
Computer Centre,  
220 Morphett St.,  
Adelaide (08) 211-8146

**N.S.W., QLD., A.C.T., N.Z.,**

**HONG KONG, TAIWAN**  
Computer Cellar P/L.,  
136 Maitland Rd.,  
Mayfield, Newcastle  
(049) 67-5700.

**or direct to...**

**VIC SOFT**

**P.O. BOX 251 GOSNELLS 6110  
WESTERN AUSTRALIA  
TEL. (09) 361 1355**



# EXPANDER BOARD FOR VIC 20

## DISTRIBUTORS:

### WESTERN AUSTRALIA

Victoria Park Computer Centre,  
38 Teddington St.,  
Victoria Park  
(09) 361-1355.

### S.A., N.T., VIC., TAS.

Computer Imports Colour  
Computer Centre,  
220 Morphett St.,  
Adelaide (08) 211-8146

### N.S.W., QLD., A.C.T., N.Z.,

HONG KONG, TAIWAN  
Computer Cellar P/L.,  
136 Maitland Rd.,  
Mayfield, Newcastle  
(049) 67-5700.

V  
I  
C  
2  
0

## SPECIAL OFFER

**ALL DEALERS:** Over \$100 worth of Software with every ARFON purchased.

### PARTICIPATING DEALERS LISTED:

|  | WAS      | NOW     |
|--|----------|---------|
| <b>ARFON 3K RAM CARTRIDGE</b><br>(with "user definable graphics")                                  | \$59.95  | \$50.00 |
| <b>ARFON 8K RAM CARTRIDGES</b>   | \$79.00  | \$69.00 |
| <b>ARFON 16K RAM CARTRIDGE</b>   | \$129.00 | \$99.00 |
| <b>ARFON 3K RAM CARTRIDGE</b><br>(with "user definable graphics"<br><u>plus the VIC TOOL KIT</u> ) | \$109.45 | \$79.00 |
| <b>DR. WATSON'S ASSEMBLY<br/>LANGUAGE BOOK</b>   | \$29.95  | \$24.95 |

## AT OUR DEALERS NOW

By now you must be delighted with your Vic 20 and are starting to realise more fully the enormous potential that this product offers.

The value of a computer that uses the same micro chip and operating system as a world wide success gives it a range that will be hard to match in a totally new computer. The addition of a colour display makes it a very up-market product right from the start.

We have taken this microcomputer with its power unit, its modulator, decided upon the expansion you would need and condensed it all into an expandable computer system. To allow you sufficient power we have replaced the small power supply with a specially designed power pack. We are giving you a mother board with 7 cartridge expansion sockets.

The cassette port and disc port are still totally usable as are the games paddles etc. Your modulator will now be held at the rear of the expansion board.

We have housed your new computer system including the Vic 20 itself in an aluminium shell. The front of the housing follows the contour of your Vic 20 while the rear is raised to give protection to your cartridges.

As an option we offer an aluminium cover to give greater security and protection, at the same time providing a base for your television. Educational users will no doubt secure this cover to the main shell preventing the removal of cartridges.

The power pack has an extra 24 volt rail and socket at the side of the shell that will power the new Arfon Micro Printer which is being especially designed for our Vic 20 range.

We wish you continued success with your new Vic 20 system and look forward to any correspondence you may like to send to our users group.

### N.S.W.

CITY PERSONAL COMPUTERS  
75 CASTLEREAGH STREET  
SYDNEY 2000

COMPUTER FOCUS  
4/224 GEORGE STREET  
LIVERPOOL

MOADS ELECTRICAL  
VINCENT STREET  
CESSNOCK

MY SPACE P/L  
2 AUTUMN STREET  
ORANGE 2800

NEW GENERATION COMPUTER STORE  
93 LONGUEVILLE ROAD  
LANE COVE 2066

SEAHORSE COMPUTERS  
10 MITCHELL STREET  
CAMDEN 2570

THE COMPUTER SPOT  
SHOP C4, MLC CENTRE  
MARTIN PLACE, SYDNEY

TOMORROW'S ELECTRICAL PLUS HI FI  
68 WILLIAMS STREET  
GOSFORD 2250

TRINITY COMPUTING  
SHOP 5, 1/9 PALMER STREET  
PARRAMATTA 2150

### VIC

EDIBLE ELECTRONICS  
50 PARK STREET  
ABBOTSFORD 3067

PANATRONICS  
691 WHITEHORSE ROAD  
MONT ALBERT

### TAS

ADVANCE ELECTRONICS  
5A THE QUADRANT  
LAUNCESTON 7250

### QLD

CW ELECTRONICS  
416 LOGAN ROAD  
STONES CORNER 4120

### W.A.

CONCEPT ENTERTAINMENT  
SHOP 15, MOUNT HAWTHORN PLAZA  
148 SCARBOROUGH BEACH ROAD  
MOUNT HAWTHORN 6016

MICRO BASE  
127 FITZGERALD STREET  
WEST PERTH 6005

### N.T.

COMPUTER WORLD  
SHOP 5 STAR VILLAGE COMPLEX  
DARWIN 5790

# Up-Dating dBase II

By John Hastwell-Batten

WHEN I read *Your Computer's* review of the dBASE II software package I was reminded of something which annoyed me when I first used it several months ago. The very first message displayed on the console when I ran dBASE II was a request to:

ENTER TODAY'S DATE (MM/DD/YY)

Now to even the most casual peruser of imported software it is apparent that most American software writers are either ignorant of the fact that the rest of the world uses numeric dates in a different format or are too arrogant to care.

I believe it is not reasonable to expect a user to change his behaviour unnecessarily to suit the vagaries of a particular computer system. After all, the computer and its software is presumably supplied to benefit the user, not the other way round. Why should one who is used to reading 9/6/82 as June 9 have to remember that in some instances it really means September 6?

I wrote a (polite) letter to Ashton-Tate, the distributor of dBASE II, suggesting that the INSTALL program offer the user a choice of date formats in the same way that FMS-80 does. That was in early November. As yet I have not even had an acknowledgement of my letter (*They did take note, John: the next update will give that choice — Ed.*).

Internally, dBASE II does not use the date for anything other than datestamping database files and reports but it does check the validity of the response to the opening prompt and will not accept those which do not conform to the (American) rules.

To my chagrin I discovered this on November 14 last year. I had been using the package for almost two weeks, stubbornly ignoring the specified format and entering dates like 12/11/82 for November 12. Suddenly I found that dBASE II wouldn't accept 14/11/82 because it knew that there were not 14 months in a year!

After suffering for a while the ignominy of having to comply with *their* rules I set about altering the game so that I could play according to ours.

Using ZSID to monitor the program I soon discovered the date-input routine starts at address 4171h and I promptly replaced it with some code to retrieve the date from my newly-acquired QT Systems Calendar/Clock board. I'll submit that patch for publication in a future issue but for those of you who don't have a system

clock I have magnanimously interrupted my sailing...Violins please, Maestro...to provide a patch which allows dates in DD/MM/YY format.

```
41DD 32B740 LD (40B7h),A
41E0 CD1235 CALL 3512h
41E3 CDED34 CALL 34EDh
41E6 CDA233 CALL 33A2h
41E9 7A LD A,D
41EA B7 OR A
41EB C27141 JP NZ,4171h
41EE 7B LD A,E
41EF 32B840 LD (40B8h),A
41F2 E603 AND 3
41F4 CA0742 JP Z,4207h
;-----;
; A disassembly of the date input
; routine of dBASE II version 2.02
;-----;

;-----;
; PROMPT FOR DATE IN MM/DD/YY FORMAT
;-----;

4171 AF XOR A
4172 32B640 LD (40B6h),A
4175 3E72 LD A,072h
4177 CD1137 CALL 3711h
417A CD1D35 CALL 351Dh
417D CDF734 CALL 34F7h
4180 CA0742 JP Z,4207h
; MONTH
4183 CDA233 CALL 33A2h
4186 7B LD A,E
4187 B7 OR A
4188 CA7141 JP Z,4171h
418B FA7141 JP M,4171h
418E FE0D CP 13
4190 D27141 JP NC,4171h
4193 32B640 LD (40B6h),A
; DAY
4196 CD1235 CALL 3512h
4199 CDED34 CALL 34EDh
419C CDA233 CALL 33A2h
419F 7A LD A,D
41A0 B7 OR A
41A1 C22242 JP NZ,4222h
41A4 7B LD A,E
41A5 B7 OR A
41A6 CA2242 JP Z,4222h
41A9 3AB640 LD A,(40B6h)
41AC FE04 CP 4
41AE CACE41 JP Z,41CEh
41B1 FE06 CP 6
41B3 CACE41 JP Z,41CEh
41B6 FE09 CP 9
41B8 CACE41 JP Z,41CEh
41BFB FE0B CP 11
41BD CACE41 JP Z,41CEh
41C0 FE02 CP 2
41C2 CAD741 JP Z,41D7h
; 31-DAY MONTHS
41C5 7B LD A,E
41C6 FE20 CP 32
41C8 D22242 JP NC,4222h
41CB C3DD41 JP 41DDh
; 30-DAY MONTHS
41CE 7B LD A,E
41CF FE1F CP 31
41D1 D22242 JP NC,4222h
41D4 C3DD41 JP 41DDh
; FEBRUARY
41D7 7B LD A,E
41D8 FE1E CP 30
41DA D22242 JP NC,4222h
; YEAR VALIDATION
```

41E9 7A LD A,D
41EA B7 OR A
41EB C27141 JP NZ,4171h
41EE 7B LD A,E
41EF 32B840 LD (40B8h),A
41F2 E603 AND 3
41F4 CA0742 JP Z,4207h
;-----;

; NON-LEAP YEAR: Ensure  
; date is not 29th February

41F7 3AB640 LD A,(40B6h)
41FA FE02 CP 2
41FC C20742 JP NZ,4207h
41FF 3AB740 LD A,(40B7h)
4202 FE1D CP 29
4204 D22242 JP NC,4222h
; DATE OK: Display dBASE II  
; identification and exit  
; to main program

4207 CD2032 CALL 3220h
420A CD2032 CALL 3220h
420D 3ABA40 LD A,(40BAh)
4210 B7 OR A
4211 C20F41 JP NZ,410Fh
4214 3E02 LD A,2
4216 CD1137 CALL 3711h
4219 219842 LD HL,4298h
421C CD3032 CALL 3230h
421F C30B41 JP 410Bh

4219 3AB640 LD A,(40B6h)
4222 CD2032 CALL 3220h
4225 212E42 LD HL,422Eh
4228 CD2D32 CALL 322Dh
422B C37141 JP 4171h
;-----;

ERROR ROUTINE: Display  
doggerel verse and  
return for another try

4222 CD2032 CALL 3220h
4225 212E42 LD HL,422Eh
4228 CD2D32 CALL 322Dh
422B C37141 JP 4171h

Listing 1 used to be a commented disassembly of the date routine from dBASE II version 2.02 but Bill Bolton, on behalf of this erstwhile rag, pointed out that it could infringe copyright and suggested that I delete all of the comments and include them in the text of this article instead. It makes the exercise more difficult but conforms more closely to standard patching procedure and is less likely to invite a lawsuit.

The following remarks apply to version 2.02 of dBASE II. The code was rearranged somewhat for version 2.3C but follows the same general pattern. The notes are pretty long-winded so I'll forgive you if you skip over the boring bits.

The code from 4171h to 4180h displays the date prompt from an external message file, accepts a string of characters from the console and strips off leading blanks. If the residual string is empty then it exits to the main program via the code at 4207h.

If the input string is not empty then dBASE II expects it to contain three numbers (month, day and year). A routine at

33A2h gets a number from the input string and returns it in DE. The code from 4183h to 4187h extracts the first number and, ignoring the high-order bits, checks the low-order bits for zero or a negative value (actually this means 128 to 255) in which case it branches back to re-issue the prompt and start over. The test for month greater than 127 is redundant because the date routine next rejects any month greater than 12.

If the month is in the range 1 to 12 then the next number is extracted from the string at 419Ch and rejected if it is zero or if any of the high-order bits is set. Depending on the month, it is then checked for a valid day by one of the code segments at 41C5h, 41CEh or 41D7h. Should the day fail the test then dBASE II branches to 4222h where it emits part of the doggerel verse "Thirty days hath September..." before re-issuing the prompt.

The code at 41DDh stores the day, extracts the next number (which should be the year) from the input string and rejects any year greater than 255. If the year is not a leap year then it also checks for and rejects February 29.

Finally, if the date passes all of the tests then the code at 4207h displays the dBASE II identification message along with the version number and exits to the main program.

In summary, if you make a gross error in entering the date then dBASE II simply clears the month field, re-issues the prompt and waits for you to re-enter the date properly. If the month and day pass the primary edits then it matches the day part of the entered date against the number of days allowed for the month (taking leap years into account) and in the event of detecting an error emits some doggerel verse before re-issuing the prompt.

Actually, the error checking is not particularly good. It allows you to make a gross error such as 11/11/999 then to reply to the re-issued prompt with a null input. It will then report a silly date such as 00/11/00 for the above example. Perhaps even worse, it will accept a date such as 11/11/111 and report it as 11/11/21. Furthermore, a month in the range 257 to 268 is treated as though it were in the range 1 to 12.

Listings 2a and 2b show the date routine re-arranged to accept dates in DD/MM/YY format and with more stringent error detection and recovery.

Listing 2a is the patch assembled for dBASE II version 2.02 and listing 2b applies to version 2.3C. If you have a different version of dBASE II then I suggest that you search for some code similar to that shown in listing 1 and study it carefully before fitting a patch to it.

The major difference between the two versions of dBASE II that I looked at is in

```

;-----  

;  

; A patch to dBASE II to allow date in DD/MM/YY format  

;  

; John Hastwell-Batten  

; 38 Silvia Street  

; Hornsby, NSW 2077  

; (02) 477 4225  

;  

; 25/5/82  

;  

; Amended for either version 2.02 or 2.3C      5/7/82  

;-----  

;  

;-----  

;.Z80  

true    equ     -1  

false   equ     0  

V202   equ     true  

V23C   equ     false  

;  

;-----  

;EQUATES FOR dBASE II Version 2.02  

dd      equ     40B6h      ;Where day of month is saved  

doggerel equ     4222h      ;Routine to display doggerel verse:  

                           ; "Thirty days hath September..."  

origin  equ     4171h      ;Address to start patching  

newline equ     3220h      ;Routine to advance cursor to next line  

dnmsg   equ     3711h      ;Routine to display a numbered message on the  

                           ; console screen  

display equ     3230h      ;Routine to display a message whose address is  

                           ; in HL on the console screen  

nlispd  equ     322Dh      ;As for "display" but first advance cursor  

                           ; to next line on console screen  

rdcon   equ     351Dh      ;Routine to read a string from the console  

                           ; keyboard  

skipbl  equ     34F7h      ;Routine to skip over leading blanks  

getnum  equ     33A2h      ;Routine to get a number from the input string  

                           ; into the DE register pair  

step    equ     34EDh      ;Routine to step over a delimiter in the input  

                           ; string and also over any blanks  

                           ; following the delimiter  

main    equ     410Bh      ;Exit address in main program  

svptr   equ     3512h      ;Routine to save input string pointer  

vmsg    equ     4298h      ;Address of version message  

mm      equ     dd+1  

yy      equ     mm+1  

;  

aseg    org     origin  

pa      prompt::  

      xor    a           ;Clear the entire date field  

      ld    h1,dd  

      ld    (h1),a  

      inc   h1  

      ld    (h1),a  

      inc   h1  

      ld    (h1),a  

      ld    a,72h      ;Message number of date prompt  

      call  dnmsg      ;Issue prompt  

      call  rdcon      ;Read string from console  

      call  skipbl      ;Strip leading blanks  

      jp    z,dateok    ;Done if null input  

      call  extractnumber ;Get first number from input string (DD) to DE  

      jp    c,doggerel  ;High-order bits should be zero  

      jp    z,doggerel  ;0 can't be a day of the month  

      ld    (dd),a       ;Store day of month  

      call  nextnumber  ;Fetch next number (MM) from input string to DE  

                           ;(high order bits in A register)  

      jp    c,prompt    ;High-order bits should be 0  

      jp    z,prompt    ;Month cannot be 0  

      cp    13          ;Should be in range 1-12  

      jp    nc,prompt    ;Error if 13 or more  

      ld    d,32          ;Days in most months +1  

      cp    4           ;April?  

      jp    z,M30        ;June?  

      cp    6           ;July?  

      jp    z,M30        ;August?  

      cp    9           ;September?  

      jp    z,M30        ;October?  

      cp    11          ;November?  

      jp    z,M30        ;December?  

      cp    2           ;February?  

      jp    nz,M31      ;  

      dec   d  

pa      M30::: dec   d  

pa      M31::: dec   d  

;  

      ld    (mm),a      ;Store month  

      ld    a,(dd)      ;Retrieve day  

      cp    d            ;Check for days in month

```

the code which exits to the main program. In 2.02 the identification message is displayed from VMSG\$\$\$\$.COM whereas in 2.3C it is displayed from address 46BBh where it is held in a mildly-encrypted form.

You can apply the patch by the usual CP/M-supported method, that is, assemble it to a .HEX file, use DDT, SID, ZSID or whatever to overlay the date routine and then SAVE the patched memory image.

You will also want to make alterations to the message file VMSG\$\$\$\$.COM (DBASEMSG.COM for version 2.3C) to make the prompt reflect the international date format. I used a direct disk editor but it can also be done with DDT. You'll find the prompt at address 1D80h onwards.

Incidentally, I use Zilog mnemonics for all of my assembly-language programming. If by necessity or (heaven forbid) by choice you use that ridiculous Intel assembly language that Les Bell is battling to make you understand then you'll have to translate the code yourself.

If you are really stuck then for the cost of postage and packing I'll supply the source code and/or .HEX files on a (free) 20cm floppy disk. I haven't used any instructions which are specific to the Z80 processor so the patch will work on an 8080.

A final word. The dBASE II code that I looked at in the course of preparing this article is rather sloppy and uneconomical.

In defence of the package I should point out that it is non-critical, 'once-only' code which is immediately overlayed by something else. I have not examined ANY other code in the package but I would hope that the standard of programming is a good deal better. □



# DICK SMITH Electronics

## SYSTEM 80

Australia's fastest selling computer

**NOW A NEW MODEL WITH EVEN MORE FEATURES AT A LOWER PRICE!**

|                        |                       |
|------------------------|-----------------------|
| • AUBURN 648 0558      | • MELBOURNE 67 9834   |
| • BANKST Sq 707 4888   | • COBURG 383 4455     |
| • BLAKEHURST 546 7744  | • RICHMOND 428 1614   |
| • BONDI JNC 387 1444   | • SPRINGVALE 547 0522 |
| • BROADWAY 211 3777    | • GEELONG 78 6363     |
| • BROOKVALE 93 0441    | • FRANKSTON 783 9144  |
| • CHULLORA 642 8922    | • BURANDA 351 6233    |
| • GORE HILL 439 5311   | • CHERMSIDE 59 6255   |
| • NORTH RYDE 888 3200  | • ADELAIDE 212 1962   |
| • PARRAMATTA 683 1133  | • ENFIELD 260 6088    |
| • SYDNEY 290 3377      | • DARLINGTON 298 8977 |
| • TIGHE'S HILL 61 1896 | • HOBART 31 0800      |
| • WOLLONGONG 28 3800   | • PERTH 328 6944      |
| • TAMWORTH 66 1961     | • CANNINGTON 451 8666 |
| • FYSHWICK 80 4944     |                       |

```

jp      nc,doggerel    ;Error if not in allowed range
call   nextnumber     ;Get next number (YY) from input
jp      c,prompt      ;Error if high bits > 0
cp      100            ;Year should be in range 0-99
jp      nc,prompt      ;Error if 100+
ld      (yy),a         ;Store year
and   3               ;Leap year?
jp      z,dateok      ;February test was valid if it is a leap year
ld      a,(mm)         ;Otherwise get month
cp      2               ;Was it February?
jp      nz,dateok      ;Date OK if it wasn't
ld      a,(dd)         ;Check day again
cp      29              ;Rule out 29th Feb if not a leap year
jp      nc,doggerel

dateok:::
call   newline        ;New line
call   newline        ;New line
ld      a,(40BAh)
or      a
jp      nz,410Fh       ;Message number
ld      a,2             ;Display sign-on message
call   dnmsg          ;Address of version message
ld      h1,vmsg        ;Display version
call   display         ;Exit to main program
jp      410Bh

nextnumber:::
call   svptr          ;Store new start-of-string
call   step            ;Skip over delimiter and any leading blanks
extractnumber:::
call   getnum          ;Get next number into DE
xor   a
sub   d
ret   c
add   a,e
ret

end

```

---

```

;-----;
; A patch to dBASE II to allow date in DD/MM/YY format
;
; John Hastwell-Batten
; 38 Silvia Street
; Hornsby, NSW 2077
; (02) 477 4225
;
; 25/5/82
;
; Amended for either version 2.02 or 2.3C      5/7/82
;-----;

```

#### .Z80

|       |     |       |  |
|-------|-----|-------|--|
| true  | equ | -1    |  |
| false | equ | 0     |  |
| V202  | equ | false |  |
| V23C  | equ | true  |  |

;EQUATES FOR dBASE II Version 2.3C

|          |     |       |  |
|----------|-----|-------|--|
| dd       | equ | 440Bh | Where day of month is saved  |
| doggerel | equ | 46F1h | Routine to display doggerel verse:<br>;"Thirty days hath September ...."     |
| origin   | equ | 4614h | Address to start patching  |
| prompt   | equ | 45D8h | Issue date prompt and start over   |
| newline  | equ | 35BFh | Routine to advance cursor to next line                                       |
| dchar    | equ | 3A15h | Routine to display a character on the<br>console screen                      |
| dnmsg    | equ | 3ADCh | Routine to display a numbered message on the<br>console screen               |
| display  | equ | 35CFh | Routine to display a message whose address is<br>in HL on the console screen |
| nldisp   | equ | 35CCh | As for "display" but first advance cursor<br>to next line on console screen  |
| rdcon    | equ | 390Dh | Routine to read a string from the console<br>keyboard                        |
| skipbl   | equ | 38E7h | Routine to skip over leading blanks  |
| getnum   | equ | 3773h | Routine to get a number from the input string<br>into the DE register pair   |
| step     | equ | 38DDh | Routine to step over a delimiter in the input<br>string                      |
| svptr    | equ | 3902h | Routine to save input string pointer   |
| vmsg     | equ | 47C2h | Address of version message   |
| mm       | equ | dd+1  |  |
| YY       | equ | mm+1  |  |

;INTERNATIONAL DATE ROUTINE FOR dBASE II v 203C

```

aseg
org  origin

```

```

xor    a           ;Clear the entire date field
ld     hl,dd
ld     (hl),a
inc   hl
ld     (hl),a
inc   hl
ld     (hl),a
ld     a,72h      ;Message number of date prompt
call  dnmsg       ;Issue prompt
call  rdcn        ;Read string from console
call  skipbl      ;Strip leading blanks
jp    z,dateok    ;Done if null input
call  extractnumber ;Get first number from input string (DD) to DE
jp    c,doggerel  ;High-order bits should be zero
jp    z,doggerel  ;0 can't be a day of the month
ld    (dd),a       ;Store day of month
call  svptr       ;Save new input pointer
call  step        ;Step over delimiter
cp    19h         ;No idea why the check for ^Y
call  z,4767h     ;Fetch MM from input string to DE
jp    c,prompt    ;High-order bits should be 0
jp    z,prompt    ;Month cannot be 0
cp    13          ;Should be in range 1-12
jp    nc,prompt   ;Error if 13 or more
ld    d,32        ;Days in most months +1
cp    4            ;April?
jp    z,M30
cp    6            ;June?
jp    z,M30
cp    9            ;September?
jp    z,M30
cp    11           ;November?
jp    z,M30
cp    2            ;February?
jp    nz,M31
dec   d
M30:: dec   d
M31:: dec   d
ld   (mm),a       ;Store month
ld   a,(dd)       ;Retrieve day
cp   d             ;Check for days in month
jp   nc,doggerel ;Error if not in allowed range
call  nextnumber  ;Get next number (YY) from input
jp   c,prompt    ;Error if high bits > 0
cp   100          ;Year should be in range 0-99
jp   nc,prompt   ;Error if 100+
ld   (yy),a       ;Store year
and  3             ;Leap year?
jp   z,dateok    ;February test was valid if it is a leap year
ld   a,(mm)
cp   2             ;Otherwise get month
jp   nz,dateok   ;Was it February?
ld   a,(dd)       ;Date OK if it wasn't
cp   29           ;Check day again
jp   nc,doggerel ;Rule out 29th Feb if not a leap year
dateok:: call  newline
call  newline
ld   hl,idmsg    ;Point at dBASE II identification
decrypt:: ld   a,(hl)    ;Get a byte from ident message
or    a           ;Test for terminator
jp   z,subversion ;Done if terminator found
rra   dchar      ;Otherwise, make the character readable
call  h1          ;Display the character
inc   h1          ;Point at next character
jp   decrypt    ;Loop until message displayed
subversion:: ld   h1,vmsg   ;Point at sub-version message
call  display    ;Display sub-version
ld   a,(441Bh)
or    a
jp   nz,445Bh    ;Exit to main program
jp   4457h
nextnumber:: call  svptr   ;Store new start-of-string
call  step      ;Skip over delimiter and any leading blanks
extractnumber:: call  getnum  ;Get next number into DE
xor   a
sub   d           ;Test high-order bits
ret   c           ;Return with carry true if non-zero
add   a,e        ;Else return low-order bits
idmsg:: db   "TTT@@",0C8h,84h,82h  ;Mildly-encrypted dBASE II
db   0A6h,8Ah,40h,92h      ;identification message
db   92h,"@@@@",0ACh,0CAh
db   0E4h,"@d\ ",0
end

```

# BIG O.E.M. & DEALER DISCOUNTS

INTRODUCING THE SUPERB  
RANGE OF DOT MATRIX  
PRINTERS FROM



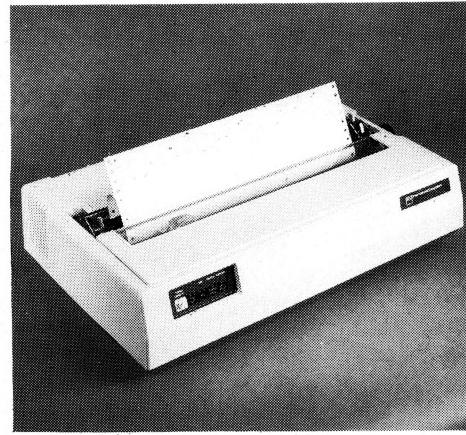
Suggested Retail  
Price.

**MODEL 3186** 200 C.P.S. DUEL SPEED \$1600 + S/T

**MODEL 3184**

120 C.P.S. 132 Col \$1380 + S/T

**MODEL 3181** 80 Col \$955 + S/T



## FEATURES INCLUDE

- EXCELLENT PRINT QUALITY
- QUIET OPERATION
- FULL CHARACTER SETS
- RS 232 & PARALLEL
- GRAPHICS
- UPPER & LOWER CASE, TRUE DESCENDERS
- 90 DAY WARRANTY.

25% to \$40%

O.E.M. DEALER DISCOUNTS  
NATIONALLY

ONLY AVAILABLE FROM:

**DATRON** Pty Ltd.

79 - 81 REGENT STREET  
REDFERN 2016. N.S.W.  
TELEPHONE: (02) 699 4824  
(02) 699 4825

# ARCHIVE DECLARES WAR ON SKIN CANCER!

To encourage you all to stay out of the burning sun, we're offering  
these summer specials for a limited time only so hurry.

The 'BULLET' single board computer with the most features and performance is available  
as a summer special at a \$200 saving.

\$795

A very fast, full featured CP/M with enhancements that takes full advantage of the Bullet hardware at a \$34 saving.

\$150

Video board to suit available soon.

\$CALL

dBase II is becoming fantastically popular and to encourage everyone to try it we have reduced the price of the demo version to \$50 a saving of \$50. If you like it, you get credit towards the real one. If you don't like it, return it for a refund and it costs you ABSOLUTELY NOTHING to try out one of the hottest selling products around. You'll also be buying from dBase experts as we use it extensively ourselves.

dBase II Demo \$50      dBase II Real \$650

Word Processing Pack  
Data Processing Pack  
Language Pack 1  
Language Pack 2  
Language Pack 3

|  |       |            |
|--|-------|------------|
| WordStar + MailMerge + SpellStar       | \$675 | save \$200 |
| Datastar + CalcStar + SuperSort        | \$530 | save \$200 |
| WordMaster + Nevada Cobol + Pascal M   | \$555 | save \$200 |
| Cbasic + Nevada Cobol + Pascal M       | \$555 | save \$200 |
| Microsoft Basic Interpreter & Compiler | \$820 | save \$100 |

We supply software on the following formats:

8"



5"



IBM Single Density (the universal standard)

Apple ● North Star Double Density (Horizon & Advantage)  
Micropolis Mod II Quad Density 16 sector (Sorceror, Vector etc)  
Osborne ● Xerox ● ICL PC ● Televideo ● ABC  
Heath Single Density ● Oki if-800 ● HP 87 and 125  
DEC VT-180 and new Personal Computers ● Otron Atache  
Wangwriter ● IBM PC ● Kaypro

New formats are being added all the time so check with us for formats not listed. All these formats are produced by us in house. We also provide a copy service from one format to another, call for details.

SEND FOR OUR LATEST PRICE LIST.

PRICES AND SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE

# archive

Computer Services Brisbane

P. O. Box 13, 23 Wagner Road, Clayfield, Qld 4011 (07) 262-2911  
Telex 44187 ARCHIV

# your CP/M computer

By Bill Bolton

IF YOU'RE interested in coming with me on the *Your Computer* trip to CP/M '83 and you haven't already asked for details you'd better do so *immediately*.

We've only a limited number of seats and rooms booked and it's filling up fast! As you can see from the following advertising 'blurb' we received on CP/M '83 there will be something for everybody. I doubt whether anyone could cover it all by themselves in 3 days.

As part of the *Your Computer* group you'll have the chance to compare notes with the others in the group and find out about those exhibits you really shouldn't miss. Also, with a strong seminar/workshop program it's often impossible to get to everything; as part of a group it usually possible find out about what happened at the workshop you missed while you joined another running at the same time.

Here's the latest 'puff' we've received on the event: *CP/M '83 is an international exposition for CP/M users, manufacturers, independent software developers, OEMs, venture capitalists, software publishers, distributors and dealers.*

*The exposition portion of the event will be the largest presentation of CP/M based hardware and software ever assembled. Hundreds of exhibits will showcase the full spectrum of applications, development aids, peripherals, accessories, publications and services for CP/M based computers.*

*The seminar and conference program will include noted leaders from the software industry such as Gary Kildall, Sol Libes, Adam Osborne, Tony Gold, Chris Morgan and John Rowley, who will conduct informative discussions exploring CP/M applications, technical information, development aids, venture capital programs and software distribution. End user workshops will show users how to get the most from their CP/M computer.*

*CP/M '83 is sponsored by Digital Research Inc, the creators of CP/M. Over 650 different companies support CP/M and more than 5000 companies produce applications packages. Most of these firms will be represented at CP/M '83. Attendees will see and try out applications packages for every profession plus state-of-the-art programs for word processing, telecommunications, graphics and database management.*

*Also on display or as workshop subjects are development aids to help you program faster, plus hundreds of CP/M*



*compatible products appropriate for your applications.*

*At CP/M '83 you can explore the entire world of CP/M under one roof and learn more in 3 days than you could in six months.*

*Registration is \$US20. It's on from January 21 to January 23 at the Moscone Centre, San Francisco (only a few blocks from where our group will stay —Ed). Seminars run from 9am to 11am, User Conferences and Workshops from 11am to 5pm, and the Exposition from 11am to 6pm each day.*

## Keeping Informed

I was talking to the people at Archive Computer Services in Brisbane about *Infoworld*, which they have been advertising in this magazine for a couple of issues. I was just interested to see how many people had taken out subscriptions — the answer was one.

I was a little surprised at this to say the least, and after a bit of reflection I decided that maybe it because very few people know what *Infoworld* is? It seems that someone in *Your Computer* should at least make an effort to tell you, as *Infoworld* has told its readers about us!

*Infoworld* is a weekly newspaper devoted entirely to the microcomputer industry. It is part of the Computer World group. Readers of the Australian edition of Computer World may have seen the small *Infoworld* inserts which appear occasionally, but they are but a pale imitation of the real thing.

The US edition of *Infoworld* is a vital source of information for anyone trying to make a living out of microcomputers; it is the only periodical with a short enough deadline to enable spotting the short term

trends in the industry.

It has a good range of regular columnists and features as well as excellent hardware and software reviews. There is a lot of CP/M material in it over a year.

Occasionally trivial, but never insignificant, *Infoworld* is on my list of 'must-read' journals. At over \$200 a year (airmail) it is certainly not the sort of thing that everyone will read but for those who 'need to know' it really should be a must.

## Black Box BIOSs

The BIOS is that part of a CP/M system which links CP/M to the specific hardware of the microcomputer on which it is running. There is an increasing trend amongst the 'smaller' microcomputers running CP/M to not provide the source code for the BIOS. For example the Osborne 1, Kaycomp 2 and Apple Soft-card CP/M systems are supplied without BIOS source code.

Since it is very difficult to make any substantive changes to the hardware configuration of any CP/M system without access to the BIOS source code, users should tread warily before committing themselves to ANY system for which the BIOS source code is not supplied.

This doesn't mean that you shouldn't buy such a system, as often they can be excellent choices for particular applications, only that you should be know what the trade-offs involved are. The manufacturer's reason for not supplying the BIOS source code is generally along the lines of "there's next to nothing to change because its a fixed hardware configuration and we don't want the problems that come from inexperienced users fiddling with the BIOS".

This has some validity but there are other points to consider. For instance there is little patch space in the CCP or BDOS areas of CP/M but there are a number of useful public domain modifications that can be made to these parts of CP/M.

As there is so little patch room in the CCP or BDOS the only alternative is to implement the patches in the BIOS with a patching routine which re-installs the patches on each warm boot. This is quite a viable technique which I use in my BIOS. However if you can't modify your BIOS you can't use the modifications!

The microcomputer industry is very volatile, and there is no way of being absolutely certain that any manufacturer of microcomputers will still be in the business next year.

They could go bust, or make a corporate decision to concentrate on other areas or even just make a massive model change. In all these cases you can expect the support for the machine you buy today to start decaying once the manufacturer is no longer producing it. The rate of decay will depend on the size of installed base of that microcomputer, the software base for the microcomputer and the determination of the remaining users to 'keep the faith'.

A reputable manufacturer (and reputable local agent) should provide ongoing support for a microcomputer model for several years after it ceases manufacture, but the support can never be as good as for the current model.

If you have access to the source code for the BIOS there is at least a fighting chance of supporting the microcomputer after the manufacturer has lost interest.

As an example consider the case of the late, lamented Processor Technology range of SOL microcomputers. One day the people who ran PT decided they didn't want to be in the microcomputer business anymore and just shut up shop.

There were a large number of SOLs out in the field and the SOL users decided that they weren't going to let the machine die. Their user group, Proteus, immediately purchased as much of the source code for SOL software as it could, as well as quite a bit of hardware and can still provide excellent support to SOL users. Similarly the major local supplier of SOL systems still maintains a good level of support for those micros.

'Black Box' BIOSs tend to discourage third party hardware support for a system. For an independent hardware supplier to consider providing support hardware (such as hard disks, real time clocks, or extra I/O facilities) for a microcomputer they must be able to get reasonable hardware and software details of the target microcomputer.

Since the 'black box' principles usually apply equally to the hardware as well as the software there tends to be little independent support for such systems.

Okay, so you have a machine with a 'black box' BIOS already, what can you do about it?

It's highly unlikely the system supplier is going to change his stand. About the only thing you can do is join the users group (or start one if there isn't one already) for your system and encourage the group to work on disassembling the BIOS as a group project: you're bound to find someone in the group has the necessary patience and

skills.

Note that the licencing agreement you signed with Digital Research only covers the CCP and BDOS, not the BIOS. Unless the BIOS is subject to specific licencing agreement of its own (which is extremely rare) you are more or less free to do what you like with it for your own purposes on your computer; after all, you have paid for it already.

Note that BIOSs may be copyrighted which would restrict your using any part of that BIOS for another computer (whether this would be defensible legally seems to be an arguable point) however as long as you only modify the BIOS for use on your own system and do not represent it as your own work or try to sell it you should be on safe ground.

### CP/M User Group

I seem to be getting quite a few enquiries lately about joining the CP/M User Group. Put simply there is nothing to join.

The CP/M User Group is not a collection of users except in the broadest sense. The Group exists as a small number of individuals in New York and Chicago who collect, catalogue and issue public domain software under the name of CP/M User Group, even amongst this small group (Ward Christensen, Jim Mills and a few others) there is no formal concept of membership.

In practice the Group is a software collection only. The software collection is distributed worldwide on disks or from RCPM systems and so on.

Anyone can contribute to software collection as outlined on most of the more recent CP/M UG disk volumes or in Lifelines magazine.

There are numerous programs from Australian CP/M users (including me) in the existing collection. New additions to the software collection are announced in Lifelines and usually on RCPM/CBBS systems (as most SYSOPS seems to read Lifelines).

Software from the CP/M UG collection is generally distributed first on 20cm standard single density CP/M disks. It is sometimes available on other disk formats locally from computer stores or suppliers, if they are interested enough to maintain disk format translation/transfer utilities.

The generally accepted basis of distribution of CP/M UG software is that:

- It cannot be sold for more than the reasonable cost of the media and a reasonable copying charge.

- Its sale cannot be tied to the supply of any other service or goods.

These are not legally enforceable rules, but are the generally agreed standard amongst reasonable retailers/suppliers. If you think someone is breaching the rules you should bring it to their attention and if they won't come into line with them, take your business elsewhere and tell others via an RCPM/CBBS system.

It seems that a reasonable charge for supplying a copy on a 20cm disk is between \$10 and \$16. The suppliers who keep their collection up to date generally seem to charge the higher rate but then you get quickest access to the latest releases.

Of course you can get it for free from an RCPM system, provided you can spare the time to download at 300 bps and get on when a volume is mounted for you. From the usage my RCPM system gets, many users seem to think that is not an intolerable time burden.

If you have an unusual disk format and can't find a supplier who has the disks available your only alternative is downloading from another system (whether it's an RCPM at 300 bps or a physically adjacent system at a higher rate). The present CP/M UG collection stands at 84 volumes (1 to 85, vol 39 withdrawn).

As well as the CP/M UG there is another UG called SIG/M which is the CP/M Special Interest Group of the New Jersey and New York Microcomputer Clubs. Their collection stands at 71 volumes, however CP/M UG vols 55 through to 77 are duplications of most of the first 25 SIG/M volumes. SIG/M only distributes to 'sub-distributors', generally RCPM SYSOPS or local users groups.

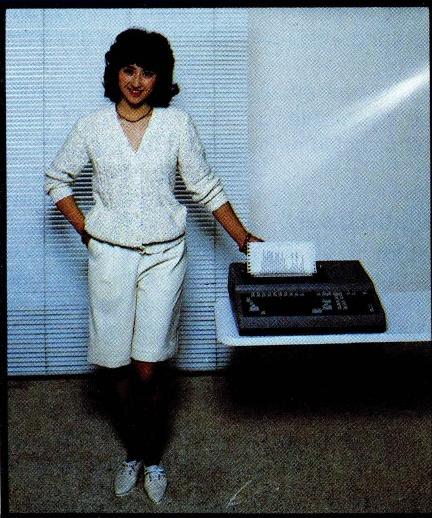
There are several smaller UGs which cover specific areas of CP/M software. The largest of these is the BDS-C UG which has a collection of 29 volumes. Their collection is mostly CP/M software written for compilation with the BDS-C compiler.

Similar UGs exist for other major CP/M compilers or software products. Usually all these groups have formal membership requirements but otherwise distribute their software on a similar basis to the CP/M UG.

As I write this CP/M UG Vols 1 to 82, SIG/M 1 to 42 (no, the new ones still haven't arrived), BDS-C 1 to 29 and MISC 1 to 14 (Aussie software plus some stuff from US RCPMs and so on) are available on request for downloading from my RCPM system.

# ...and SIGMA/OKI made it happen!

other people said it had to happen, but SIGMA/OKI made it happen with the SIGMA/OKI IF800 personal computer



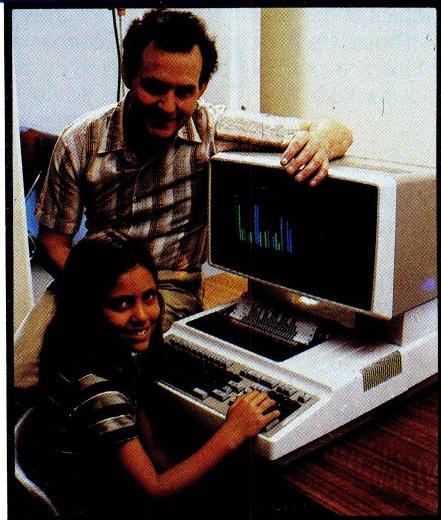
Model 10  
Personal Computer  
from \$1,790\*

**Standard capabilities** 64K RAM, 10 programmable function keys (no shift needed), Z80A processor (no extender board needed), 4MHz cycle speed, 640 x 200 dot bit addressable graphics, eight foreground plus eight background colours, full 99 station keyboard, upper/lower case, separate numeric & cursor pads, RS232, light pen, audio cassette, composite video, 40/80 columns, ROM cartridge, and 80 cps 80 column microline printer (fully integrated).

**Standard Model 20 capabilities** All the above, plus high resolution colour monitor, 10 super function keys, dual 384KB diskette drives. Fully integrated desktop package. Options available now: Centronics, IEEE, A/D and D/A, light pen, ROM pack, monitors, 8" diskette and much more.

#### The SIGMA/OKI is available now from:

**New South Wales** (Sydney City) King Street Computers (02) 29 8554 (Sydney North) Minimicro Supermart John F. Rose Computer Services (02) 439 1220 (North - Brookvale) Computermart (02) 93 1383 (South - Redfern) Cybernetics Research (02) 698 8286 (East - Bondi) Software Source (02) 389 6388 (West - Guildford) AED Micros (02) 681 4966 **Victoria** (Melbourne City) PSIComp (03) 654 2351 (South - Albert Park) Computer Edge (03) 690 1477 **Queensland** (Brisbane City) The Data Professionals (07) 229 7101 (South Brisbane) Argonaut Computer Sales (07) 44 7491 (North Brisbane) Archive Computer Services (07) 262 2911 (Cairns) Computer Concepts (070) 51 7317 **Australian Capital Territory** (Canberra) Boulevard Business Systems (062) 48 5411 **South Australia** (Adelaide) Disk Computer Systems (08) 271 4299 Southern Information and Robotics (08) 212 7936 **Western Australia** (Perth) Taimac Corporation (09) 328 1988 (Bunbury) South West Business Systems (097) 21 6677 **Tasmania** (Hobart) Quantam (002) 34 5506 **New Zealand** (Auckland) Microprocessor Development (New Zealand 9) 54 0128



Model 20  
"All-in-one Professional Computer  
from \$5,990\*

**Software available now** CP/M (standard), BASIC (interpreter and compiler), COBOL, FORTRAN, Pascal, PL/1, Wordstar, Supercalc, Spellstar, FMS-80, Supersort and much more. Applications available now: Padmede fully integrated, simple to use invoicing, Debtors, Stock, Creditors, General Ledger. Other applications from IMS, Boulevard, John F. Rose, Cyres and the whole CP/M world. Ready to use on the Australian Beginning.

**SIGMA/OKI**

SIGMA/OKI Microcomputers,  
11th Floor, 157 Walker St.,  
North Sydney, 2060  
Dealer Enquiries: David Thomas (02) 436 3777

There are sometimes CP/M special interest groups associated with local microcomputer clubs. For instance, the Melbourne Microcomputer Club (MICOMP) has a CP/M SIG which holds regular meetings. The South Australian Microcomputer Group doesn't have a CP/M SIG but seems to have a fair number of active CP/M users and often features CP/M topics at its meetings and in its newsletter. Those are the ones that I'm aware of, there are possibly others around in Australia as well.

#### PAMS News

Let me introduce a new buzz word. PAMS stands for Public Access Message Systems. Its an American term that is used to generically describe all Bulletin Board or similar systems.

Its not totally accurate in that it allows for restricted membership systems to be included (such as MiCC) as long as the membership is open to the public, but is as good as any other and its the defacto standard.

As yet there are very few PAMS in Au-

stralia — two active and one inactive, but as the number is sure to steadily grow it's about time someone started to get a reference system for them going.

So in future when you see a reference to PAMS you will have some idea that there may be a list of available systems and their phone numbers associated with it. For those interested in what a PAMS list can grow to, there is a very big one on The Source which lists systems world wide (including my RCPM).

While there is only the present small number of systems I hope to be able to cover the news of them in this column; in the future, who knows?

#### Mi-Computer Club Bulletin Board

The MiCC BBS is temporarily off line while a new CP/M microcomputer based system is being set up in place of the original Reality time slice operation.

This will mean a faster, better BBS for MiCC members but will take a little while to get going. MiCC now has the hardware and is just waiting for the software to get sorted out (I've no connection with MiCC

other than as a member and am just sorting out the communications software for them).

#### Melbourne CBBS On Line

The Melbourne Microcomputer Club has put a CBBS system on line. The MICOMP CBBS is a message exchange only — even though it runs on a CP/M system you do not get access to CP/M and cannot use it to exchange programs.

Still, it is a very useful service to the Melbourne microcomputer community, and you don't have to be a member of MICOMP to use it (though I guess they would be happy if you joined up). Amongst other things the CBBS contains details of upcoming CP/M SIG meetings.

The CBBS software is a direct descendant of the very first microcomputer bulletin board system set up back in 1977 in Chicago by Ward Christensen and Randy Suess so is a nicely refined and reliable system.

The phone number is (03)762-5088 (24 hours) and the data format is 8 data bits, 1 stop bit, no parity. You need your modem

## PADMEDE on Sigma/Oki if 800 personal computer.

Padmede has produced a special suite of accounting packages for the if800 Models 10 & 20. The Padmede Business Control System is a modular but compatible range, covering invoicing, debtors, stock control, creditors and general ledger.

All modules are very easy to implement and operate. Documentation is comprehensive and easy to follow. The Sigma/OKI Microcomputer team is supporting all its Dealers in making Padmede's software available.

Original development took place in England, with Barry Meredith and John Perry of Padmede in Australia making extensive changes to suit local requirements. This included use of the advanced Sigma/OKI facilities such as high resolution colour display and inbuilt 80 cps printer.

Sigma/OKI Personal Computers also have a large library of software from other suppliers. These include Digital Research, Micropro, Sorcim, and Australian applications from Cyres, Boulevard, IMS, John F. Rose and others.



Kathy McLean and Barrie Meredith from Padmede

Packages ready for use under CP/M include Wordstar, Mailmerge, Supercalc, Spellstar, DBase II, FMS-80, Supersort and many many more.

**Our dealers will be pleased to give personalized advice. The Sigma/OKI Dealer index can be found earlier in this issue.**

**SIGMA/OKI**

SIGMA/OKI MICROCOMPUTERS  
11TH FLOOR, 157 WALKER ST.,  
NORTH SYDNEY.  
Dealer Enquiries: (02) 436 3777 David Thomas

set to 300 baud, full duplex, originate mode (the same as for my RCPM system).

The hardware supporting the CBBS is a 'Big Board' with a pair of 20cm drives. The SYSOP is Peter Jetson.

Peter is interested in getting an RCPM going in Melbourne but needs help with hardware (from suppliers?) and encouragement (from potential users?). Leave a message from him on the CBBS.

Now we are two; the Sydney 'Software Tools' RCPM and the Melbourne 'MICOMP' CBBS. Where will the next remote access microcomputer system appear?

#### RCPM News

Some support software from Trevor Marshall for the ETI modem is now available on the system.

There is a 'BYE' communications supervisor and a MODEM7 communications program for the ETI Modem.

Trevor also sent over some other interesting software collected from his RCPM system in California, including a

versions of MODEM7 patched to run on the Osborne 1 and Kaycomp 2 computers. From other sources there has also been some communications software for the IBM PC available through the system as well as some CP/M-86 programs.

I've decided to stop sending out the 'Connection Notes' for the time being. The system is so heavily used now that it is difficult for new users to get onto it so there is little point in sending out notes.

There is some hope of other RCPM systems coming on line in the future (you'll find out in this column when they happen so please don't ask for details) and when that happens I'll start making the notes available again in some form. Perhaps they'll be published in *Your Computer* at a later date as they have a lot of general advice about successfully establishing communications with any other computer system (micro or otherwise).

For those of you who have the notes and have been unable to get through there is yet some hope. Recently I tried an experiment with a 'Boredom week' for regular users.

During this week there were no software requests mounted and the system was fairly static. The usage by regular users dropped off a little as a result so there was an opportunity for some new users to at least get a chance to access the system. As there was an unprecedented number of new users coming on the system during that week I can only judge it as a success.

At some stage in the future (but not too soon) I'll probably have another boredom week, so keep trying.

When you publish offers to help people with mailings and request SSAEs you can usually expect a fairly high number of requests to breach the rules laid down in some way (no stamps, no address, no name, extra requests for info or whatever).

I've sent out a very large number of connection notes now and have only had a tiny percentage of requests for them that weren't able to be satisfied. I guess that says quite a lot about the intelligence of microcomputer users as a section of the community...well done! □

## ACCOUNTING ON MICROCOMPUTERS IS OUR BUSINESS

The microcomputer is now considered vital in the quest for greater business efficiency. To be successful for everyday business use, microcomputers depend on sound proven software.

Which is why we at Padmede Commercial Systems, recognizing this need, offer a unique range of integrated accounting packages for a wide range of microcomputers.

- \* Invoicing
- \* Stock Control
- \* Contract Costing

- \* Debtors Ledger
- \* General Ledger
- \* Quotation & Estimation

- \* Creditors Ledger
- \* Incomplete Record Accounting
- \* Time & Cost Recording

By specializing in accounting systems we can offer greater depth of support to the management of your company. And our services continue long after we've supplied and installed the system.

Available on

- \* Sigma/Oki 800
- \* Sirius 1
- \* I.C.L. Personal Computer
- \* NEC PC8000
- \* Altos

- \* Toshiba T200
- \* Osborne 1
- \* Sharp MZ80B
- \* DEC VT180
- \* Datamax

- \* 3M/Ibex
- \* Wangwriter
- \* Sharp PC3201
- \* Apple II
- \* Xerox 820

For details contact:

**Padmede Commercial Systems**  
275 Alfred St., North Sydney, 2060.  
(02) 92-6783 (02) 920-5136

# your computer clinic

## Reaching RAM

COULD YOU please explain how a processor such as the Z-80 can address more RAM than 64K (0xFFFFH). I've been waiting to build a micro for some time, but this question has me stopped.

Could you suggest some places that I can collect information on building a Z-80 micro (I already know about Steve Ciarcia's book).

Could you please tell me where to find information on the MOS Technology 6545 video generator chip (featured in the AT MicroBee), or any other easier flexible video generation systems.

C HAYNES  
Faulconbridge, NSW

**Without the aid of external circuitry, most 8-bit microprocessors can only address 64 Kbytes of RAM. This is a fundamental limitation of their 16-bit address buses. However, it is possible to selectively enable and disable multiple banks of RAM, generally using a latch connected to an I/O port to control the circuitry.**

Thus, to enable bank 1, the processor would output a byte of all zeros except bit 1 to the bank select port (typically port 40H in Cromemco and Alpha Micro systems). To select bank 2, the byte to be output would be 00000010, and so on. This scheme allows addressing of up to 8 banks, generally of 48K. In most systems, the top 16K of memory stays permanently enabled and contains the bank switching code and generally most of the operating system (for example, MP/M II).

Other schemes fully decode the bank select port, allowing up to 256 banks of memory. Finally, some recent systems utilise the

**full 24-bit addressing capability of the S-100 bus to allow a theoretical maximum of 16 Megabytes of memory.**

On the subject of building a Z-80 micro, Ciarcia's book is about the best I've seen. To complement it, I'd recommend 'Interfacing to S-100 (IEEE 696) Microcomputers', by Sol Libes and Mark Garetz, and published by Osborne/McGraw Hill.

Incidentally, the same publisher also has a book entitled 'The CRT Controller Handbook', by Gerry Kane, which contains all you'll need to know about the 6545, if you can't get hold of the manufacturer's data sheets and application notes.

## Microbee MOVer

IN YOUR Assembler articles, you use the Intel 8080, which uses the MOV instruction.

I have ordered a MicroBee, as well as an Editor/Assembler. I am wondering if the Z80 will accept the MOV instruction, or if I must use the LD instruction? Please enlighten me!

Also, could you please include in the mag a more sophisticated MicroBee column, because I didn't learn anything last month!

Oh, by the way, thanks for a new look into computer technology through your fantastic mag!

RICHARD WALKER  
Wynyard, Tas

**Re the MOV instruction: both the 8080 and Z-80 execute the same instruction; it's just that Intel copyrighted the assembly language mnemonics so that Intel couldn't use them in its documentation.**

If you have a Z-80 in your

CP/M system, the examples will work as given using the CP/M assembler. Other assemblers accept the Zilog mnemonics, such as the TDL/Xitan assembler.

It's only the assembler that makes the distinction; otherwise the MOV and LD instructions are the same.

Re the Microbee column: we're teaching Richard as fast as we can, but please be patient as we think he may be our most successful office idiot yet...

**Help Me, Cap'n Bluebeard**  
I BUY your magazine regularly and enjoy reading it. You also seem to be good at solving problems. So here is mine.

When you buy a program, for example Sargon II, it comes on its own disk. Now if I copy that with Locksmith, I have another copy also on its own disk. The trouble is it takes up too much disk space, one program per disk.

Someone gave me a copy of Sargon II which someone copied for him, except this is just a normal, FID copyable program.

How does one make a program, on its own disk, into a normal Applesoft program? Simple question isn't it?

CONTRAN LEWIS  
Burnie, Tas

The simple answer, if you think the cost of the diskette is too much to pay for a professionally written program, is to invest some hours (probably hundreds) in learning about DOS, machine language, and the way data is written to disks.

The person who breaks the copy protection on a disk (as someone did with your Sargon) does so by getting into it with a track/

sector editor and figuring out exactly how it is protected, then re-writing bits of code (or lifting the program portion a chunk at a time) to build up a normal, unprotected binary file.

Depending on the sophistication of the copy protection (the latest methods are very good) this task will vary from quite simple to impossible-for-the-non-genius.

Locksmith simply copies the disk bit-for-bit, duplicating the original exactly with the copy protection intact, which is why it too uses a whole disk.

## Budget-Beater

BEING a poor student with a limited (nearly non-existent) budget, I have been looking for a way of getting around the high (to me) price of printers.

Is there any way to modify a standard teleprinter to receive 300 or 1200 baud RS-232 C from my MicroBee?

DAVID DOWNS JNR  
Numurkah, Vic

**No, you'd have to rewrite a large chunk of the monitor program to output characters as 5-bit Murray code instead of the 7-bit ASCII it uses now. In addition, you'd need to build an interface circuit to convert the RS-232C voltage levels to 80V double current signalling.**

The correct answer to your question, therefore, is that there is a way, but that it isn't easy. This is what computer salesmen call compatible.

## What Not To Buy

I AM interested in buying a home computer in the not too

distant future, but I am basically a novice in this field. Firstly I would like to say that I am not going to ask what should I buy but rather could you point out any problems you think I may be getting myself into depending on which system I buy.

First let me say that I want a machine that will be able to entertain me (which computers do anyway) — that is, to play games, also to be able to run my own programs and lastly it must be expandable.

Also my other main interest is photography and I have recently been looking at the Electrosonic systems to run multi-image slide/tape programs.

This system's heart is the Apple II Europlus computer fitted with 64K memory, disk drive with disk controller card,

interface card for up to 24 projectors, Electrosonic ES4057 multiplex clock card and the Esclamp Multivision production software.

As unfortunately I cannot afford an Apple, fully decked out as described above, I am after a micro that could be usable now for games/programming, but that could be expanded to take the Electrosonic components as my finances make them available.

The two units I have been looking at are the MicroBee and the Concord II — which I gather is almost an Apple.

Therefore can the Bee be made to accept Apple BASIC? Can it be expanded to take extra Apple cards? Can it be expanded to 64K and take a disk drive? If the Apple can be expanded to take a Z-80 card can the re-

verse be done to a Bee? Is it too much of a hassle for a novice or what?

Would the Concord be totally compatible? My only problem at the present is that the Concord is a little too pricey for me.

**KEVIN BUCK**  
Montmorency, Vic

**It's not just a bit much for a beginner, it's a bit much for a pro!** Apple BASIC programs can be converted to run on the Microbee, but it will not accept Apple cards, and any program which is hardware dependent (and from what I've seen of Apple programs that's the majority — almost anything involving PEEK or POKE, for instance) cannot be transported easily between computers unless you are

**totally familiar with both.**

**Yes, a 6502 card could be designed for the Bee, but there's not a great deal of point really. The result would not be either fish or fowl, would have virtually no software support and just could not succeed.**

**Apple copies and look-alikes are a touchy subject right now. I honestly cannot recommend that anybody buy anything that claims to be Apple compatible, because with the lawsuits currently flying around, it might not be on the market for long, and then where are you going to get it serviced, maintained, and so on?**

**Sorry to pour cold water but there is no way out of the old law: the more you pay, the more you get.**

## ribbons galore

### Means exactly that!

We have the A to Z range of ribbons for word processing computers, terminal printers, typewriters plus print wheels and NEC Spinwriter thimbles®.

#### For example:

**Epson MX 80 Cassettes \$11.25 ea.  
Epson MX 100 Cassettes P.O.A.  
Tandy TRS-80 Cassettes \$9.75 ea.**

**Why not ask about our refilling facilities for all empty cassettes?**

*Ring now*

## ribbons galore

A specialist company. • We deliver, fast, Australia-wide.  
No order too large or small.

**SYDNEY • 83 Longueville Road,  
Lane Cove (02) 428-3833  
BRISBANE • (07) 371-2687**

## APPLE SOFTWARE

### G-PASCAL VERSION 2

Improved, more powerful version of our popular Pascal compiler ..... \$85

### G-PASCAL ADVENTURE

Skeleton adventure game written in G-Pascal for you to enhance. Includes source code on disk, listing and hints ..... \$35

### G-PASCAL RUNTIME SYSTEM

Run G-Pascal P-codes independently of the compiler. Very useful. (Requires Version 2 compiler) ..... \$35

### G-PASCAL STARTER KIT

Introductory offer — all of the above combined ..... \$110

### LIFE

Hi-res machine code of J. H. Conway's 'Game of Life'. Displays up to 44,800 'lives' ..... \$35

### GRAPHICS DUMPS

Datasouth DFS180 printer ..... \$40  
OKI Microline 84 printer ..... \$40

### DIGICARD-80 VISICALC CONVERTER

Run Visicalc with Digicard-80 — use all 80 columns — upper and lower case ..... \$50

All prices include airmail postage.



Send cheque or  
bankcard no. to: **Gammon & Gobbett  
Computer Services Pty Ltd**

P.O. Box 124, Ivanhoe, Vic. 3079

# SUBSCRIBE TO **your computer** MAGAZINE FOR BUSINESS AND PLEASURE

**PLUS! FREE  
MEMBERSHIP TO  
MI-COMPUTER  
CLUB!**

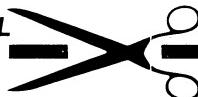
and every month you can keep right up to date with the exciting realm of computing. Read our news and reviews on business and leisure machines, software, peripherals and "gadgets" — and don't forget our tutorials and the pocket programs you can use!

**PLUS**



If you subscribe to YOUR COMPUTER magazine this month you will receive FREE membership to the MI-COMPUTER CLUB. This entitles you to discounts on floppies, folders, books, and software; a monthly newsletter; interactive membership — with members Australia-wide; problem help; eligibility to join the club bulletin board; and more!

**CUT OUT AND MAIL**



**your computer**  
MAGAZINE FOR BUSINESS AND PLEASURE

140 JOYNTON AVE.  
(P.O. BOX 21) WATERLOO 2017  
PHONE (02) 662-8888

RENEWAL  NEW SUBSCRIPTION  EXTENSION OF EXISTING SUBSCRIPTION

1 year subscription      2 year subscription

|   |                               |                               |
|---|-------------------------------|-------------------------------|
| Special Offer: subscription, club membership, magazine binder, sticker (2 of each for 2 year sub) | \$30 <input type="checkbox"/> | \$56 <input type="checkbox"/> |
| Subscription only, plus free club membership  | \$24 <input type="checkbox"/> | \$46 <input type="checkbox"/> |
| TOTAL PAYMENT   |                               |                               |

HERE IS MY APPLICATION FOR ONE YEAR'S SUBSCRIPTION TO YOUR COMPUTER MAGAZINE. I UNDERSTAND THIS ALSO ENTITLES ME TO BECOME A FREE MI-COMPUTER CLUB MEMBER AND TO PARTICIPATE IN ALL THE CLUB HAS TO OFFER.

Mr/Mrs/Miss/Ms .....

Address .....

..... Postcode ..... Phone .....



Please charge Bankcard No

|  |  |  |  |  |  |  |  |  |  |  |  |
|--|--|--|--|--|--|--|--|--|--|--|--|
|  |  |  |  |  |  |  |  |  |  |  |  |
|--|--|--|--|--|--|--|--|--|--|--|--|

Expiry Date ..../..... Signature .....

# THE Home Accountant

By Peter Sandys

WITH A computer taking pride of place in my study (oops, sorry dear — now the nursery) my financial affairs definitely need managing. In the good old (pre-computer) days when I had money to burn there was no need to keep a check on where or what I spent it on.

Alas, things are different, I have greater need now to keep track of my finances. So I turned to my trusty slave to provide the answers.

I was helped along the way by developing a model on my trusty Visicalc program. I spent hours typing in each day of the week, a column for outgoings, a column for incomings and a column for description. The model would total the difference and subtract it from balance left in the bank. If I made two payments in a day I cheated and entered one a day earlier or later depending on space. I used it for a month and then I gave it away.

Next on the scene was Apple's Personal Finance Manager. This was a great improvement as I was also able to set budgets for expenses.

However, it lacked one fundamental item, the ability to record details of cash payments. So I had to arm myself with a series of deposit forms (courtesy of my local bank) and use these as fake cheques and record these on the system. Also there was no way I could record my savings at the building society. This I had to lump with my cheque account and at reconciliation time remember to add together the balance in the cheque account to the savings and cash. This was fraught with danger as my maths is not so crash hot.

Finally I was given The Home Accountant which, in case you were wondering, is what this article is all about.

The program is designed to help you keep track of all your income, expenditure, assets and liabilities and print out reports. It comes in a handsome padded binder and is well documented. It requires only one disk drive but two drives save you having to swap disks.

The Home Accountant has a number of very powerful features. It allows you to keep up to five separate cheque accounts which can be linked to one common budget. As well you can have five separate cash accounts.

This feature is important for professional people who want to keep certain accounts separate from others. On the same point it is also possible to flag expenditure for taxation purposes.

Another feature of the program is that if



you use a credit card the system allows for keeping a record of transactions and hence the balance outstanding on that card. When you write a cheque (or cash) to pay the credit card account the system will decrease the amount of your balance on both without the need for a double entry. You can also allow for regular periodic payments.

When you first start the relevant steps you need to take are highlighted by the program. If you try to skip a step it will not allow you to, until you have created a cheque account and one cash account. When you create any category you have the option of allowing for a projected figure for any month thus creating a budget. The budget can be altered by a transaction or by an edit module.

Furthermore on the creation of accounts you can have five categories — assets, liabilities, credit cards, income and expenditure. You are limited to 100 individual sub headings under these categories.

When you enter a transaction it is stored with eight fields. Date, Check Number, Paid to, Amount, Memo, Category, Tax, Cleared.

The Home Accountant manages this differently to Personal Finance Manager, in that these entries are listed down the screen and only one entry is visible on the screen at any time. PFM permits you to see more than 10 entries on the screen by using columns. PFM's method would be superior except that with the 40 column screen the amount of information you can enter for each field is limited.

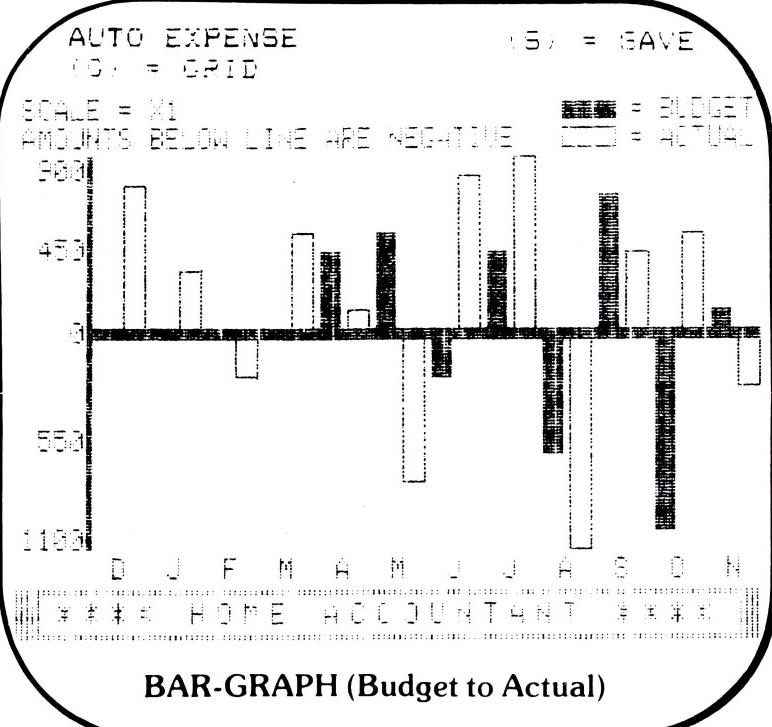
Some nice features of the Home Accountant's entry routine are:

**THE SPLIT TRANSACTION:** With this you can use one cheque payment for multiple accounts. Similarly you can do the same for cash or credit cards.

**CATEGORY SEARCH:** The program lets you enter the beginning letter of a category and then search through every category until you find the right one to classify the entry. This is invaluable for forgetful (or disorganised) people. Also, if you have a hardcopy listing of the categories you can enter the number of

## Software Report Card

|                          |                                     |           |      |      |
|--------------------------|-------------------------------------|-----------|------|------|
| <b>Program:</b>          | Home Accountant                     |           |      |      |
| <b>Made By:</b>          | Continental Software                |           |      |      |
| <b>Useful for:</b>       | Home, Small Business, Professionals |           |      |      |
| <b>Hardware Req'd:</b>   | Apple II (Printer Preferable)       |           |      |      |
| <b>Ratings:</b>          | excellent                           | very good | good | poor |
| <b>Documentation</b>     |                                     |           | ✓    |      |
| <b>Ease of Use</b>       |                                     |           | ✓    |      |
| <b>Speed</b>             |                                     |           |      | ✓    |
| <b>Functionality</b>     |                                     | ✓         |      |      |
| <b>Support</b>           | ✓                                   |           |      |      |
| <b>Value-for-money</b>   | ✓                                   |           |      |      |
| <b>Extras included:</b>  | N/A                                 |           |      |      |
| <b>Price:</b>            | \$94                                |           |      |      |
| <b>Review copy from:</b> | Imagineering                        |           |      |      |



the category and the program will list the name.

**PERIODIC PAYMENTS.** It is possible to set up to five automatic transactions. As soon as you initialise a month these are posted.

### Reports And Graphs

The program generates a large number of reports and will even print out cheques.

The reports can be printed on almost any field and may be specific to that field (for example, all cheques paid for rent or to a certain party).

Other reports include year's budget, or actual; balance sheet; net worth statement; income and expense summary; category listing; comparative balance sheet (current v previous month); comparative income and expense; and credit card and cash activity reports.

The graphs can be printed if you have a graphics printer. These are bar and line graphs, and trend analysis. If using a colour monitor these can be graphed in colour.

### Is It Australianised?

Yes and no. Imagineering has arranged for the date to be changed so that our convention of day first is accepted, and reports are printed out with these dates.

The no applies to the section when you start the system and record personal details of address and postcode. When you enter the state only two letters are allowed (okay for NT, WA and SA); also, you need five digits for postcode. Imagineering advises this will change in the near future.

The Home Accountant is the best pro-

gram I have seen for personal and small professional use. It is logical in its operation and has a lot of detail. There are some criticisms that I have, some concern me and some may concern other people.

The first is the speed. Because of multiple overlays of programs the speed is greatly affected. This is because standard DOS is slow. You can overcome this by first booting an FDOS disk then inserting Home Accountant and entering 'RUN HELLO'. The speed improvement is worthwhile.

Second is the printer support. It will not work with the Epson type II/ printer cards. These are very popular printers and unless they can write a driver for them the program will have a limited market.

The printers supported are Epson with Digitek Printmaster card, Anadex 9501, IDS 440, 445, 460, 560, Okidata Microline 80 (not 82), NEC 8023A, TI810, and Diablo, Qume and Itoh letter-quality printers.

I was not able to test it on the C Itoh dot-matrix printer. Cards it supports are Apple Parallel and Serial, SSM ASIO & AIO II and Mountain Hardware multifunction. I have not tested it on all these cards or printers — these specs were from the manual. Epson and Microline 82 were from personal experience and advice from others.

The third problem comes when you want to delete an erroneous record. These can only be edited, declassified and the balance made zero. This may be of importance to you or maybe not. Also, when you finish with a month you cannot make any further adjustments to it. □

**CALL US TODAY**

### BRISBANE

CPU COMPUTER CENTRE  
279 JUNCTION ROAD  
CLAYFIELD 4011 QLD

PHONE: (07) 57 8023

SOLE DISTRIBUTOR FOR:  
MICROTECHNOLOGY INC. USA.

### PERTH

MICROBASE  
422 NEWCASTLE STREET  
WEST PERTH 6005 W.A.

PHONE: (09) 328 9308

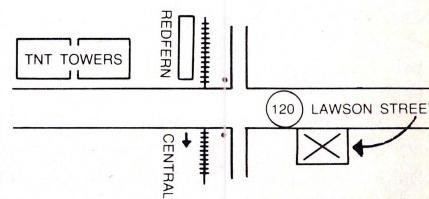
LARGEST RANGE OF  
MICROCOMPUTERS IN W.A.  
HITACHI PEACH - XEROX 820  
ARCHIVES

### SYDNEY

CYBERNETICS RESEARCH  
120 LAWSON STREET  
REDFERN 2016 N.S.W.

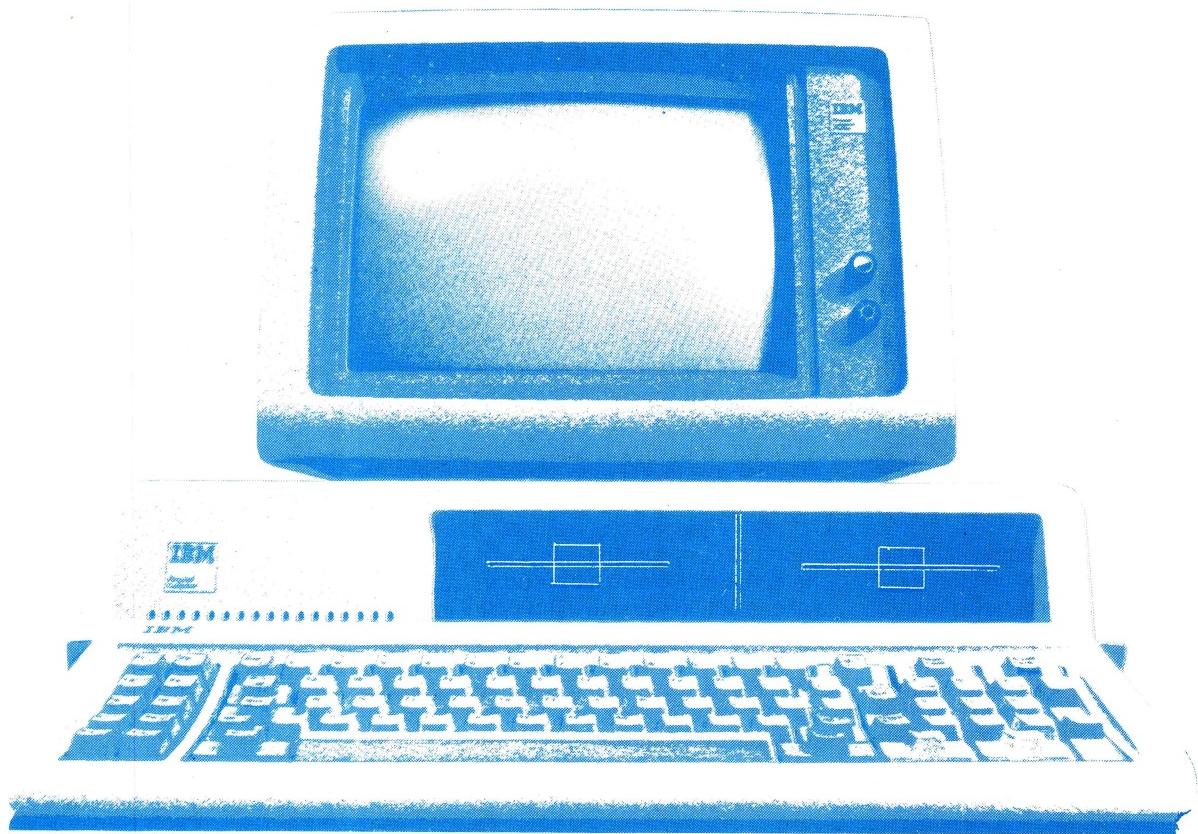
PHONE: (02) 698 8286 699 3690

HITACHI PEACH - SIGMA/OKI  
FAIRLIGHT LIGHTWRITER  
NEC PC 8000 - SIRIUS I



# WE FELL IN LOVE AND SO WILL YOU WITH YOUR IBM PERSONAL COMPUTER

NOW AVAILABLE



## HARDWARE

64K – 256K RAM  
160K – 320K DUAL DRIVES  
MONOCHROME OR COLOUR GRAPHICS  
MS DOS OR CP/M 86  
ASYNCH. COMMUNICATIONS  
HARD DISK 7, 16, 20, OR 27M  
IEEE-488  
D/A:A/D CONVERSION  
MANY MORE

## SOFTWARE

VISICALC  
WORDPROCESSING  
IBM FORTRAN, PASCAL, COBOL  
AND MACRO-ASSEMBLER  
TIME MANAGER  
ACCOUNTING  
UCSD FORTRAN AND PASCAL  
DATABASE, ASYNCH. COMMUNICATIONS  
MANY MORE

NOW AVAILABLE: VISICORP SOFTWARE FROM IMAGINEERING PLUS MICRO MODELLER

# Apple Disk Peeker

By Steven Zanker

THIS PROGRAM will allow you to indirectly 'peek' at the contents of an initialised diskette, which up until now has been hidden territory for many Apple users.

It is the third of my series of utility programs using the RWTS subroutine; for further information, I suggest you refer to the first two.

LINES 500 — 900 display the variables used. The buffer for the disk sector is located immediately above HIMEM (line 560).

LINES 2000 — 2400 display the locations changed during program execution. For faster program execution, delete these lines.

LINES 2420 and 2440 poke into memory the controlling subroutine (assembly language).

The usual interrogation section begins at line 4000, requiring slot and drive numbers to be entered. Lines 4120 to 4220 poke into the IOB (Input Output Block), the slot, drive, volume, and buffer address. Note that the volume number is zero, which means that any volume number will be acceptable.

LINE 6000 begins the actual peeking segment. Before the sector can be read, the track and sector numbers are required (line 6040 — 6100). At line 6180 the sector is read, and an error check is made. If an error occurs a jump is made to 10000, for a message to be displayed. The only possible errors are DRIVE ERROR and READ ERROR.

From line 6200, the sector last read is displayed. The standard Apple screen, being only 40 by 24, is too small for a formatted display, so I have divided each sector into quarters.

The first quarter displays bytes 0 to 63, the second, bytes 64 to 127 and so on. After a read, the quarter indicator is set to 1 (line 6180). Across the top and side of the screen appear inverse grid reference numbers, from which the exact byte of the sector can be calculated (lines 6200 — 6260). Each byte appears as a 3 digit number (000 — 255), and underneath, the represented ASCII character. The array CA% is used to change the value to the range 32 to 95, because control characters are not normally displayed (lines 6280 — 6380).

The program then waits at line 6420 for a single keystroke. To view the other quarters of the sector, press key 2, 3 or 4, and it will be displayed in the same format (line 6440).

The arrow keys will cause the next sector either side to be read. Note that if the current sector is at either end of the disk, and one of these keys are used, a 'wrap-around' occurs, and the sector at the other end is read; Likewise if the current sector is at one end, the first (or last) sector in the next track is read (lines 6480 and 6520).

Pressing RETURN will cause a jump back to the track and sector questions (6500). Pressing ESC will end the program (6540). Any other key is invalid, and beeps the bell.

Here are a few interesting locations to be found on an APPLE initialised disk:

Those locations appear in the DOS section of the diskette. DOS, as you may know, is loaded into memory from the diskette when booting.

The disk directory is to be found in track 17, beginning at sector 15, and working backwards. Refer to pages 129 to 131 of the DOS manual. □

```
10 REM DISK PEEKER
200 REM -----
220 REM !           APPLE !
240 REM ! DOS 3.3 DISK PEEKER !
260 REM !
280 REM ! AUTHOR: S.ZANKER !
300 REM ! WRITTEN: 31.MAR82 !
320 REM \-----/
500 REM

<> VARIABLES <>
520 A = 0:B = 0
540 ANSWERS = ""
560 BUFFER = PEEK (116) * 256
580 D$ = CHR$ (4)
600 DRIVE = 0
620 GS = CHR$ (7)
640 SECTOR = 0
660 SLOT = 0
680 TRACK = 0
700 DIM CACHRADJUST(7)
2000 REM

<> BYTE MAPZ <>
2020 REM

++ RWTS MAP ++
2040 REM 768-84=CONTROL SUB
2060 REM 800-16=IOB
2080 REM 817-20=DCT
2100 REM 832 =ERROR FLAG
2120 REM

+ LOCATIONS ACCESSED +
2140 REM ----IOB----
2160 REM 801 =SLOT NUMBER * 16
2180 REM 802 =DRIVE NUMBER
2200 REM 803 =VOLUME NUMBER
2220 REM 804 =TRACK NUMBER
2240 REM 805 =SECTOR NUMBER
2260 REM 808&9=BUFFER ADDRESS
2280 REM 812 =COMMAND CODE
2300 REM 813 =ERROR CODE
2320 REM 814 =ACTUAL VOLUME
2340 REM 815 =PREVIOUS SLOT
2360 REM 816 =PREVIOUS DRIVE
2380 REM ----ERROR TABLE-----
2400 REM 832 =ERROR FLAG(-128)
2420 FOR A = 768 TO 824: READ B:
POKE A,B: NEXT A

2440 DATA 169,3,160,32,33,217,3,176,
1,96,169,128,141,64,3,24,96,0,0,
0,0,0,0,0,0,0,0,0,0,1,96,
```

| TRAK | SECT | BYTE | DESCRIPTION  |
|------|------|------|--|
| 1    | 7    | 132  | Start of valid dos commands                          |
| 1    | 8    | 7    | End of DOS commands                                  |
| 1    | 8    | 65   | Parameters (,V ,D ,S ,L ,R ,B ,A ,C ,I ,O)           |
| 1    | 8    | 116  | Start of DOS error messages                          |
| 1    | 9    | 61   | End of DOS error messages                            |
| 1    | 9    | 117  | Greeting program name                                |
| 1    | 9    | 184  | 'APPLESOFT'  |
| 2    | 2    | 167  | 'TIAB' (file types Text, Integer, Applesoft, Binary) |
| 2    | 2    | 171  | CATALOG title "DISK VOLUME" spelt backwards.         |

PORTABLE BUSINESS

OSBORNE 1

NOW KAYPRO II

COMPUTERMAX

539 PITTWATER RD, BROOKVALE 2100. (02) 93-1383, A.H. (02) 918-1718

COLOURFUL BUSINESS

HITACHI PEACH

NOW OKI if 800

```

1,0,18,6,49,3,34,34,0,0,1,0,0,
96,1,0,1,239,216
2460 FOR A = 0 TO 7: READ CA%(A): NEXT A
2480 DATA 64,0,0,-64,-64,-128,-128,-192
4000 REM

<> INTERROGATION <>

4020 TEXT : HOME : INVERSE : LIST 200,380:
NORMAL : A = PEEK (37): POKE 33,9:
HOME : TEXT : VTAB A
4040 VTAB 16: INVERSE : PRINT "SLOT NUMBER
(1-6) ":"; NORMAL : INPUT ANS: ON ANS =
"" GOTO 8000:SLOT = INT ( VAL (ANS)):
IF ABS (SL - 3.5) > 2.5 THEN
PRINT GS: GOTO 4040
4060 POKE 801,SLOT * 16
4080 VTAB 20: INVERSE : PRINT "DRIVE NUMBER
(1/2) ":"; NORMAL : INPUT ANS: IF ANS = ""
THEN PRINT GS: GOTO 4040
4100 DRIVE = INT ( VAL (ANS)): IF
ABS (DR - 1.5) > .5 THEN
PRINT GS: GOTO 4080
4120 POKE 802,DRIVE
4140 POKE 803,0
4160 POKE 809,BUFFER / 256
4180 POKE 808,BUFF - PEEK (809) * 256
4200 POKE 815,SLOT * 16
4220 POKE 816,DRIVE
4240 HOME : VTAB 21: PRINT
"-----":
VTAB PEEK (37)
4260 PRINT "[1] / [2] / [3] / [4] = SECTOR QUARTER"
4280 PRINT "NEXT SECTOR: [>]FORWARD [<-]BACKWARD"
4300 PRINT "[RTN]NEW TRACK & SECTOR [ESC]END PROG.";
4320 POKE 35,20: VTAB 1: PRINT
6000 REM

<> PEEK HERE <>

6020 HOME
6040 VTAB 8: INVERSE : PRINT "TRACK NUMBER (0-34) ";
: NORMAL : INPUT ANS: IF ANS = "" THEN 4000
6060 TRACK = INT ( VAL (ANS)): IF ABS (TR - 17) >
17 THEN PRINT GS: GOTO 6040
6080 VTAB 12: INVERSE : PRINT "SECTOR (0-15) ";
: NORMAL : INPUT ANS: IF ANS = "" THEN
PRINT GS: GOTO 6040
6100 SECT = INT ( VAL (ANS)): IF ABS (SEC - 7.5) >
7.5 THEN PRINT GS: GOTO 6080

```

```

6140 POKE 804,TRACK
6160 POKE 805,SECTOR
6180 CALL 768: ON PEEK (832) > 127 GOTO 10000:Q = 1
6200 HOME : INVERSE
6220 S = (Q - 1) * 64
6240 FOR A = 0 TO 7: HTAB 6 + A * 4: PRINT A;;
NEXT : PRINT
6260 FOR A = 0 TO 7: VTAB 3 + A * 2: PRINT
RIGHTS (" " + STR$ (A * 8 + (Q - 1) * 64),3):
NEXT : NORMAL
6280 FOR A = 0 TO 63
6300 B = PEEK (BUFFER + S + A)
6320 V% = A / 8:H% = A - V% * 8
6340 VTAB 3 + V% * 2: HTAB 5 + H% * 4:
PRINT RIGHTS ("00" + STR$ (B),3)
6360 VTAB 4 + V% * 2: HTAB 6 + H% * 4: PRINT
CHRS (B + CA%(B / 32))
6380 NEXT : VTAB 20: INVERSE
6400 PRINT "TRACK=";TR;" SECTOR=";SECT;
" QUARTER=";Q;" ?";
6420 NORMAL : GET ANS
6440 IF ABS (ASC (ANS) - 50.5) < = 1.5
THEN Q = ASC (ANS) - 48: GOTO 6200
6480 IF ANS = CHRS (8) THEN SE = SE - 1: ON
SE > = 0 GOTO 6140:SE = 15:TR = TR - 1:
ON TR > = 0 GOTO 6140:TR = 34: GOTO 6140
6500 IF ANS = CHRS (13) THEN 6000
6520 IF ANS = CHRS (21) THEN SE = SE + 1: ON
SE < 16 GOTO 6140:SE = 0:TR = TR + 1: ON
TR < 35 GOTO 6140:TR = 0: GOTO 6140
6540 IF ANS < > CHRS (27) THEN PRINT
GS: GOTO 6420
8000 REM

```

<> END OF RUN <>

```

8020 TEXT : HOME : LIST 10
8040 PRINT "END OF RUN."
8060 END ::::::::::::::::::::: RUN
10000 REM

```

<> ERROR HANDLING <>

```

10020 POKE 832,0: FLASH : HOME : PRINT
10040 IF PEEK (813) = 64 THEN PRINT
"DRIVE ERROR";GS: GOTO 10100
10060 IF PEEK (813) = 128 THEN PRINT
"READ ERROR";GS: GOTO 10100
10080 PRINT "DISK-ERROR ERROR";GS
10100 NORMAL : A = PEEK (37): TEXT :
VTAB A: STOP ::::::::::::::: RUN

```



# VIC SOFT

**NEW!**

**SPECIAL OFFER**  
SOFTWARE WORTH \$100  
WITH EVERY  
ARFON SOLD

**NEW VIC-20 BOOK with cassettes**  
— Introduction to Basic programming Part 2  
**NEW BOOK — 30 EXCELLENT GAMES**  
— Complete listings & program structure.

**VIC-20 PERSONAL COLOUR COMPUTER \$399**

Over 100 software cassettes available from \$14 inc:

|                        |                        |             |                |
|------------------------|------------------------|-------------|----------------|
| Victek (5 + 3K)        | Word Processor (8,16K) | Amok        | CARTRIDGES     |
| Tank Wars              | Home Inventory         | City Bomber | Omega          |
| Amazing                | Home Finance           | Dig & Burry | Jelly Monsters |
| Alien Blitz (Invaders) | Home Finance           | Packman     | Avengers       |
| NEW EDUCATION!         | Vic calc               | Skier       | Star Battle    |
| Read, spell            | Typing Trainer/Tutor   | Ski Run     | Alien          |
| Advanced maths         | User Graphics          | ICB Mission | Chess (Sargon) |

3K, Super 3K, 8K, 16K RAM Cartridges, Joysticks and Joystick conversion kits.  
Books — VIC REVEALED LEARN PROGRAMMING PARTS 1 & 2, DR WATSONS ASSEMBLY LANGUAGE.

**apple** personal computers

**Apple II and Apple III 48K-256K**  
Latest **Apple Imagineering** Software  
Diskettes, Books and Reference Manuals

**BUSINESS APPLICATIONS**

- Visischedule
- Visicalc Electronic Worksheet
- Visicalc Business Planning Template
- Personal Filing System
- Cash Book
- Accounting Modules
- Communications
- Graph Plotting
- Mail List

INSTALLATION AND STAFF TRAINING

**SOFTWARE & HARDWARE**

- Word processing — 80 column
- Graphics
- Communications
- Education — NEW SERIES
- Books
- Languages
- Utilities
- LATEST Games

**ALSO OPEN THURS. P.M.  
THURS. A.M.  
SAT. A.M.**

**COMPUTER SYSTEM SPECIALISTS**

# Computer Focus

4/224 George Street, Liverpool. (02) 600 8222

**EXTENDED BUSINESS HOURS UP TO CHRISTMAS**

# SUPER 80 USERS

**WE ARE NOW OFFERING THE  
MOST COMPETITIVELY PRICED  
RANGE OF PROGRAMMES  
ON TAPE INCLUDING:**

- Games
- Utilities
- Educational
- Special user required support

FOR FULL INFORMATION CONTACT

**BEMAK** PTY LTD

**PO BOX 218  
BELCONNEN ACT 2616  
Phone 586862 or 511558**

# your OSBORNE computer

By Greg Stringer

OVER THE last few months there have been various articles and reviews about the Osborne 1 computer. This unit is now so well established in the community, it is about time for a column in *Your Computer* dedicated to the Osborne user.

Over the next few months I will be presenting some background information on the Osborne 1, with some software and hardware reviews.

The initial articles will be aimed at the novice user and, I hope, will evolve into a useful reference-guide for future users.

Where the column goes after that will largely depend on you. It is, by rights, *your* forum for ideas and programming hints, so that we can all help one another. Please participate with any questions, tips or programs you would like to share with other Osborne users.

I will be keeping a copy of the monthly columns on diskette, so that future users may take advantage of the information published, without that soul destroying search for that back-copy that seems to have sold out all over town.

## Down To Business

I have acquired one of the 'new' Osbornes, but for those of you with the earlier model (the majority), I will pass on a few observations regarding the differences from the older "Set, Wireless, No. 19, British troops for the use of" machine (YC May 1982).

The first point to stress is that, in component design and machine performance, both versions of the Osborne are identical. The major changes with the new machine are mainly cosmetic.

The first change that strikes the user is that, at last, there is a spiral keyboard connector instead of the cumbersome wide parallel cable that would sometimes obscure the screen. Three locating lugs on the top edge of the keyboard enable the main body and the keyboard to be 'locked' together for easier desk-top usage.

A sliding vent on the top-rear of the unit also helps with cooling on those hot days when I do my work down by the pool in the back yard!

Internally the chassis that holds the inards in place has been reworked and I notice that my machine has Rev 1.4 ROM. More news on what changes are contained in the ROM later.

Probably one of the most widely used programs on the Osborne is 'Wordstar'. The flexibility of the program, both in the

options provided for manipulating text, and in its capacity to be configured to so many CP/M based computers, is the biggest hurdle the beginner has to overcome.

We are lucky that all the Osborne users are supplied with a standard configuration of Wordstar since communication of ideas can be directly translated from one user to another. Probably the biggest variation between users will be in the type of printer that may be hooked onto our computer to obtain hard copy. Over the next few months I will try to supply interfacing and installation instructions for most of the popular printers on the market today.

## Running An Epson

I would hazard a guess that the Epson MX80 and MX100 printers are probably the most popular dot matrix printers in the world. To use an Epson printer with our Osborne requires four steps:

- Obtain a cable to connect the IEEE488 edge connector on the front panel, to a 'Centronics' style plug on the back of the Epson.
- Set the dip switches on the Epson for the default character set and printing characteristics.
- Use the SETUP program on the system disk and set the printer option to Centronics.
- INSTALL, or tell 'Wordstar' what command sequences are required to perform the special printing characteristics, like bold print, double strike, emphasized printing and so on.

Suitable cables should be available from your local dealer. If you feel you would like to make your own, obtain a 26 pin female edge-connector, up to 3 metres of 26 core parallel cable and a 36 pin amphenole connector (male).

Configure the cable so that the wires connected to the IEEE interface are soldered to the appropriate pins on the amphenole plug as shown in the accompanying table. There is a diagram of where pins 1 through 26 are located on the IEEE connector in the users manual.

OSBORNE 1 IEEE  
EDGE CONNECTOR  
PIN #

|    |        |    |
|----|--------|----|
| 1  | DATA 1 | 2  |
| 2  | DATA 5 | 6  |
| 3  | DATA 2 | 3  |
| 4  | DATA 6 | 7  |
| 5  | DATA 3 | 4  |
| 6  | DATA 7 | 8  |
| 7  | DATA 4 | 5  |
| 8  | DATA 8 | 9  |
| 10 | GROUND | 30 |
| 11 | STROBE | 1  |

EPSON CENTRONICS  
CONNECTOR  
PIN #

|    |        |    |
|----|--------|----|
| 12 | GROUND | 19 |
| 15 | BUSY   | 11 |
| 16 | GROUND | 29 |
| 18 | GROUND | 21 |
| 19 | SELECT | 13 |
| 20 | GROUND | 20 |

## EPSON DIP SWITCH SETTINGS FOR SWITCH BLOCKS 1 & 2

|       |     |       |     |
|-------|-----|-------|-----|
| 1 - 1 | ON  | 1 - 5 | ON  |
| 1 - 2 | ON  | 1 - 6 | ON  |
| 1 - 3 | ON  | 1 - 7 | OFF |
| 1 - 4 | OFF | 1 - 8 | ON  |
| 2 - 1 | ON  | 2 - 3 | OFF |
| 2 - 2 | ON  | 2 - 4 | OFF |

Your Osborne and printer are now physically ready to 'talk' to one another. All that remains to be done is to tell the CP/M operating system what kind of printer you will be using. This is done using the SETUP program found on the system disk that came with your Osborne.

Load and run the program as indicated in the manual, changing the printer option (A) to show Centronics when the main options menu is displayed. Now save this new CP/M configuration on all the working disks you will want to use with the Epson printer.

I don't suppose it is necessary to state that you should *never* use the original disks that come with your system. You should make working copies of your supplied disks (using the copy program) and make any changes to the working disks, leaving your original disk as your library backup copy.

You are now ready to use your printer with any of your CP/M programs.

To try it out, boot the system with one of your new 'modified' disks. Do a directory listing by typing DIR. You should see on the screen a listing of all the files on your default disk drive. Assuming the printer is connected, and the ready light is green type control-P (done by holding the CTRL key down while you type the letter P). Now repeat the step above and enter DIR. The printer will list the file directory on the screen.

## WordStar Set-Up

WordStar, as you know, has some very nice features, some of which control the way in which text is printed, such as boldface, or super- and sub-scripting.

What we have done so far is to tell the CP/M operating system that a centronics printer is attached and that any output to the printer should be sent to that device. If we want to take advantage of the extended printing features offered by Word-

Star, then we will need to tell that program the control character sequences it has to send to the printer, to change the way the printer will print the text.

We do this with a program on the UTILITY disk called *Install*. We tell the *Install* program what parameters the Epson will require. When finished, *Install* will physically rewrite parts of the WordStar program on disk.

In the manual there is a very good step-by-step procedure for running the *Install* program — I will not attempt to repeat it here, but will provide you with the parameters you will require to make the Epson behave the way you want.

The parameters below have been worked out by Jim Woolley who writes for *The Portable Companion*, a US-based Osborne magazine, and are based on the Epson MX80 type III and MX100 printers:

- Insert the Utility disk in drive B and your working copy of WordStar in drive A.
- Warm-boot the system (Ctrl-C) and type the command *B:/INSTALL*.
- Answer the first question regarding 'normal first-time INSTALLation' with N for no.
- Answer the next question with the D option, to modify and run your existing WS.COM file. When asked for your WordStar filename enter A:WS.COM.
- The *Install* program will ask you about your terminal, printer, communications protocol and printer driver. Answer U(n-changed) to each and verify your answer with Y(es) when asked.
- When the last question is displayed asking if the modifications are complete reply N(o).

Enter the patches, as indicated below, by typing in the parameter address or name. Where there are multiple operands for a given parameter press return twice after each operand is entered.

This is the end of the patches.

### **The New WordStar Commands**

The WordStar commands, to invoke the different Epson print modes, are as follows:

**Ctrl-Y:** Emphasised double print toggle. Do not use twice in the same line, as the second cancels the feature for the entire line. Do not use with Ctrl-A.

**Ctrl-A:** Alternate pitch (132 char/line). Do not use in the same line as Ctrl-N, since Ctrl-N cancels the feature for the entire line. Do not use with Ctrl-Y or Ctrl-Q, as these temporarily suspend the effect of Ctrl-A.

**Ctrl-N:** Standard pitch (80 char/line). This is the default mode. Do not use in the same line as Ctrl-A.

**Ctrl-Q:** Set emphasised mode. Do not use with Ctrl-A.

**Ctrl-W:** Cancel emphasized mode. This is the default mode. Do not use in the same line as Ctrl-Q, since Ctrl-W cancels the feature for the entire line.

**Ctrl-E:** Set expanded pitch (40 char/line if used with standard pitch Ctrl-N, or 66 char/line if used with alternate pitch Ctrl-A). This mode is automatically cancelled at the end of the line. It may be cancelled in mid-line by the use of Ctrl-R.

**Ctrl-R:** Cancel expanded pitch. This is the default mode. □

### **PARAMETER OPERANDS**

|            |                                     |
|------------|-------------------------------------|
| Ø6A1       | Ø1                                  |
| PSCRLF:    | Ø3,ØD,ØA                            |
| PSHALF:    | Ø2,ØD,ØA                            |
| PALT:      | Ø1,ØF                               |
| PSTD:      | Ø1,12                               |
| USR1:      | Ø2,1B,45                            |
| USR2:      | Ø2,1B,46                            |
| USR3:      | Ø1,ØB                               |
| USR4:      | Ø1,14                               |
| RIBBON:    | Ø4,1B,45,1B,47                      |
| RIBOFF:    | Ø4,ØB,46,1B,48                      |
| PSINIT:    | ØC,12,14,1B,46,1B,48,1B,41,Ø6,1B,32 |
| PSINIT:+11 | Ø3,12,14,1B,46,1B,48,1B,41,ØC,1B,32 |
| Ø          |                                     |

**AUTHORISED  
DEALER**



**commodore  
COMPUTERS**



ADVANCED WORD PROCESSING  
BUSINESS SYSTEM  
DEVELOPMENT TRAINING SYSTEM  
ADVANCED BUSINESS SYSTEM (8000  
SERIES)  
ECONOMY BUSINESS SYSTEM (4000  
SERIES)  
PROFESSIONAL/EDUCATIONAL  
SYSTEM



PERSONAL — ENTERTAINMENT  
EDUCATIONAL — SYSTEM

★ 27K MEMORY EXPANSION BOARD  
FOR VIC 20 NOW AVAILABLE

## **COMMODORE HARDWARE AND SOFTWARE SPECIALIST**



**MICRO  
VISIONS**

Contact:  
MICHAEL LA ROBINA,  
472 ANZAC PDE.,  
KINGSFORD, NSW 2032.  
(02) 662-4063.

# your APPLE computer

By Peter Sandys



I'VE RECENTLY received in the mail a program from Cairns called the Golden Slipper. The program is a horse racing simulation with a difference. Being from the state where everyone gets a percentage of the take it was of no surprise that the winner is the one who runs the tote...

The program has a high-resolution display of the race including some fancy horse-racing music while the starter moves into his box.

It does not randomly pick a winner, instead it selects it on a weighted basis, plus chance. The weighting is based on the form from previous races, the odds, and occasional outside factors like illness, crooked jockey, nobbling and so on.

The market for the program may be limited because of the sophistication of other entertainment packages; however for those interested in horse racing and betting games at \$15.95 it would be good value.

It may also be of interest to those who want a sure fire way of raising funds at a charity benefit (for example, the Queensland old politicians welfare fund). Contact Cairns Software at 13 Karloo Cr, Woree, Cairns 4870.

**Books, Books, Books...** There are an incredible number of new books around for the Apple. I will outline a few I borrowed from City Personal Computers.

*Apple Graphics and Arcade Game Design*; by Jeffrey Stanton: this book goes into teaching you to learn high-res graphics from BASIC and machine language. You can learn how to speed up your

graphics with raster graphics and bit mapping techniques. It teaches the theory of how to design game.

It does require you to have a reasonable knowledge of Basic programming skill. It is advisable to have one of the assemblers like Merlin. Published by The Book Co.

*Golden Delicious Games For The Apple Computer*: if you get past the off-putting title you will find this is another helpful book on Apple programming.

It was written in conjunction with one of the authors of Apple Basic Data File Programming (listed below). Topics covered are Music and Sound effects, Low-res graphics, High-res graphics, data entry, text games, and other games.

It has a number of games you can type in like Story, Blockout, Match, Concentration, Stars and more. Each game is well documented with REM statements and additional text comments to explain what is happening within the design of the program. These are invaluable for those trying to get an understanding of programming.

The programmers have tried where possible to use similar modules for input routines and so on within each program. They explain how to use the renumber program to link these modules into various programs hence saving a lot of typing. It costs \$18.50.

*Assembly Lines: The Book*, by Roger Wagner; published by Softalk. It is a readable and easy way to start into machine language.

The book is a collection of the first 15 articles in this series from Softalk magazine. It is invaluable for those who want to follow the current series as the book gives the beginning parts. The standard of writing is what I have come to expect of Softalk which is one of the best Apple mags around.

The book takes you step by step through machine language and goes into more depth than Inman did in Apple Machine Language. It costs \$29.95.

*Using 6502 Assembly Language*: another good book on assembly language, this time by Randy Hyde who wrote Lisa 2.5.

Like Wagner (who promotes the use of the Merlin Assembler), Hyde recommends you use his assembler program while using the book.

This book is at a higher level than Wagner's and assumes the reader is more dedicated to learning. As such it is a

shade harder to read but gets into the nitty gritty much quicker.

While I find Wagner easier to comprehend I think Hyde would give a greater depth. Suggest you spend half an hour reading the first chapters of both to find whose style is best for you. If not buy both. Cost is \$29.95.

*Apple Basic*: by Richard Haskell, it is written for the beginner and the advanced programmer. Haskell writes in a very easy to read style and is logical in his approach to the subject.

It is a book which deals in taking you from simple BASIC to low-res graphs to high-res and peeking and poking. He assumes nothing which means the first chapters are for the real novice.

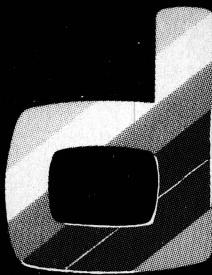
I believe it is very worthwhile for those of you who would like an easy to read and informative book on the intricacies of Apple BASIC. It is not of great interest to those who have a good working knowledge of the Apple. Price is \$15.75. □

CUSTOMIZED  
TECHNOLOGY

Specializing  
in support for the  
ZM  
P.C.

**BUSINESS PACKAGES,  
UTILITIES, GAMES  
CATALOGUE NOW AVAILABLE**

P.O. BOX 424  
799 6373      ASHFIELD      799 6373  
NSW 2131



# DIGICARD INTRODUCES 80 COLUMN **VISICALC™**



C14  
VALUE C1  
30

Display of formulae up to eighty characters long with no need to horizontally scroll —

1 U +B11\*B13+@LOG(B12...B15)/(F15-F16)+D16-D17\*(5-G15)/@LOG(10)

2-----

3 6 MONTH PROJECTION DATE

4 ..... 10/9/82

5-----

6 Manufacturing Costs

7 PRODUCT Monthly 30(DA) 60(DA) 90(DA) 120(DA) 150(DA) 180(DA)

8 Sales

|              |                 |         |         |         |         |         |         |
|--------------|-----------------|---------|---------|---------|---------|---------|---------|
| 9 Product A  | 70              | 7500.00 | 0.00    | 7500.00 | 7500.00 | 7500.00 | 7500.00 |
| 10 Product B | 30              | 3000.00 | 0.00    | 3000.00 | 0.00    | 3000.00 | 0.00    |
| 11 Product C | 25              | 0.00    | 4000.00 | 0.00    | 0.00    | 4000.00 | 0       |
| 12 Product D | 50              | 0.00    | 3800.00 | 0.00    | 3800.00 | 0.00    |         |
| 13           |                 |         |         |         |         |         |         |
| 14           | TOTALS          | 10500   | 7800    | 10500   | 11300   | 20      |         |
| 15           | SALES INCOME    | 18505   | 18505   | 18505   | 18505   |         |         |
| 16           |                 |         |         |         |         |         |         |
| 17           | OVERHEADS       | 6000.00 | 6000.00 | 8000.00 |         |         |         |
| 18           |                 |         |         |         |         |         |         |
| 19           | WORKING CAPITAL | 2005    | 6710    | 3       |         |         |         |
| 20           |                 |         |         |         |         |         |         |
| 20           |                 |         |         |         |         |         |         |

NORMAL 40-COLUMN DISPLAY →

80-COLUMN DISPLAY →

DIGICARD VISIPAK  
LETS YOU SEE  
ALL THE  
FIGURES

## ADD THE PROFESSIONAL TOUCH

The DIGICARD VISIPAK doubles the display capacity of VISICALC 3.3 to 80 characters across by 24 lines. Imagine a spread-sheet D O U B L E the width. All VISICALC commands are displayed in both upper and lower case.

DIGICARD VISIPAK also allows entry of lower case characters into labels for improved readability.

The DIGICARD VISIPAK is available from your dealer at the special introductory price of \$349.00. (Normally \$427.00)

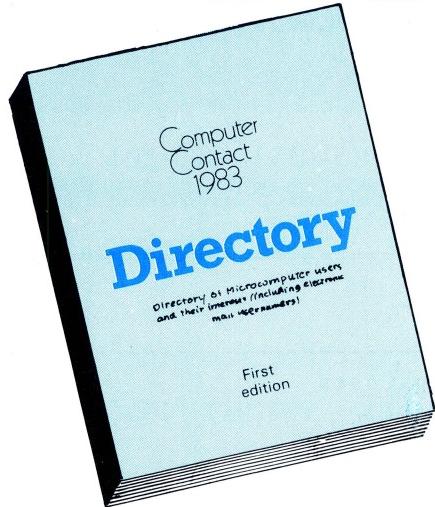
Call by your APPLE dealer, see a demonstration, and take advantage of this special offer.

If you have any queries or would like more information on DIGICARD products call Maclagan Wright and Associates PTY/LTD on (03) 436-1351.  
Offer closes December 31st, 1982.

# Register NOW

for inclusion in

## Computer Contact 1983



DIRECTORY OF MICROCOMPUTER USERS  
AND THEIR INTERESTS (INCLUDING  
ELECTRONIC MAIL USERNAMES)

An indispensable handbook for all microcomputer users interested in establishing contact (electronic or otherwise) with other local users, or users with similar interests. Fully indexed by user name, by user location and computer type, and by interests.

One fully inclusive fee of \$A15.00 includes the publication of your entry and the supply and postage of one copy of the directory during February 1983.

**Privacy provision.** On request, your address and 'phone number may be withheld from publication, with any mail resulting from your entry being directed to the publisher. The redirection of these letters will incur an additional charge of \$A5.00 per six redirections (payable in advance).

CLOSING DATE FOR ENTRIES 7 JANUARY 1983



INFORMATION  
PATHWAYS

PO Box 26 Black Rock Vic 3193  
25 Central Avenue  
(03) 589 5657 589 5611  
TAB Infopath

Send to:  
**FREEPOST 26\***  
Information Pathways  
25 Central Avenue  
Black Rock 3193  
Australia

Please register my entry for **Computer Contact 83** and supply one copy by surface mail during February 1983; all for the fully inclusive cost of \$A15.00 (plus \$A5.00 if privacy provision required).

- My cheque/money order is enclosed.  
 Please debit my credit card. Expiry date \_\_\_\_\_  
 Bankcard  Amex  Diners Club  Visa

Card number \_\_\_\_\_

Signature \_\_\_\_\_

Name \_\_\_\_\_

Address \_\_\_\_\_ Postcode \_\_\_\_\_

Telephone (STD \_\_\_\_\_) \_\_\_\_\_

**Interests** (maximum eight)

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_
6. \_\_\_\_\_
7. \_\_\_\_\_
8. \_\_\_\_\_

**Privacy provision required?** Yes/No

Are you able to offer general assistance to other local users?

Yes/No

Computer \_\_\_\_\_

Tape based? Yes/No

Disk format \_\_\_\_\_

Operating system \_\_\_\_\_

Are you able to electronically communicate over phone lines?

Yes/No

**Electronic Mail User Names/ID**

Aust. Beginning \_\_\_\_\_

The Source \_\_\_\_\_

Other (specify) \_\_\_\_\_

\*No stamp  
required if  
posted in  
Australia



## LINTON-SIMPKINS

IF YOU LIVE in an inner Sydney suburb then you will be familiar with the sinking feeling that you get when your door bell rings and you open it to two young men in funeral suits who introduce themselves as 'Elder So And So and Elder Who's It'.

They are as difficult to move away as a snorkel-equipped Federal Labor MP sifting through the bottom of some harbour or other. On at least two occasions I have begun to call in the local Heat in an endeavour to regain the quiet enjoyment of my front verandah.

The local Heat, being more than fully occupied cruising the region's pubs to offer Her Majesty's, God bless her, hospitality to the purveyors of illegal substances, offered sympathy and the advice that I ought to buy a large dog.

The Mormons are famous for three things, the Osmond family, the alleged underwear worn by all those Elders and the church's long-abandoned practice of plural marriages or polygamy. Bearing in mind the sad lack of endurance of most men, it would seem to be a better system design to employ polyandry, a fact known in the 14th century as can be witnessed from the first novel of the third day of the Decameron.

Which all has very little to do with how I found myself some 240 metres above Sydney in the company of certain citizens such as Vance Gledhill, Neil Houston and Lionel Singer as the latter's newest computer was being launched. Or maybe the Mormons, or more accurately the members of the Church of Jesus Christ of the Latter Day Saints, have a lot to do with me being that high at 11.00 am on a Tuesday.

It seems that the Mormons are going to have a fourth thing to make them famous shortly, their expertise in making electronic gear. Since the late 1960s Univac has had a terminal-making plant in Utah, the Mormons' home state which was named after the Shoshone Indians — as any crossword doer knows.

Now Elder Singer's new computer, called Wicat, is made in Utah like the Shoshone and world land speed records. It will be managed by Elder Gledhill who has left the Deanery at NSW Institute of Technology and it will be sold by a team headed by Elder Houston who has fled the guardian walls of IBM and kicked the Blue and Grey Habit.

After a quick re-read of the above it occurs to me that my reader may be wondering how Elders Singer, Gledhill, Houston, Linton-Simpkins, Dustin Heuston (would I lie to you?) and the assembled Computer Press of Australia were all able to stay 240 metres above Sydney in the company of about a half a dozen Wicat computers?

We were not in a giant cargo helicopter, we were in fact in the third level down from the top of the Sydney tower. When I arrived Elder, no since he's top man at Wicat Utah, Eldest Dustin Heuston was extolling the many virtues of the wicat.

I arrived late because Big Red the family road whale was out of petrol due to a strike and I had to push it three kilometres to get there. Then once at the base of the tower finding the lift entrance was not easy, so I was about half an hour late. So there I sat watching the city laid out beneath me and inspecting, in between the passing of tug-boats, a nearby parked and idling Wicat.

The Wicat looked good and I wasn't about to tear my eyes away from it until the clouds to the west broke up, and there in the midst of green fields was my old school. There was the flag-pole on the top of the building on which we had run up the Economics Master's pyjamas and then cut the halliards, there was the open space that used to be the school nine hole golf course and there was the rowing shed and the famous leaning pile. It was too much and even the excitement of Elder Dustin couldn't drag me back until the clouds closed over again.

Wicat is an odd name for a computer, but then it is a strange computer. For a start it doesn't use Intel micros but Motorola ones. Since the house computer at my place also uses Motorolas, I was sold on the Wicat just from that concept alone.

But enough of this, I think it's time that a look was taken at how the various companies handle their new computer releases.

Frankly, these shows have become a mite low budget lately since the various overseas parent companies realised that having a story in a major Australian paper means having it in the Computer section where it will be read only by computer people.

You simply can't trust an important thing like the purchase of a computer to a computer man, can you?, it's far too important. So a story in the computer sections means that you are preaching to the converted. It would be like tracking around Salt Lake City seeking to find and convert a non-mormon.

IBM and Wang always go for information overkill, Lionel Singer has always aimed to sit down in front of a screen and have you run your own demonstration. As a sales concept the Singer way works full well. But as far as I go, three years hard labour in front of a screen has rather soured me towards self-demonstrating. But the hands-on thing is still great for less soured computer writers and I notice that Lionel and Vance were having a lot of takers for their try and show thing.

One thing that sticks in my mind about the Singer/Wicat sky show was the statement made by Dustin Heuston about how one Saturday morning at 2am he had arrived at his Utah plant to find 40 per cent of the people still at work.

Since John H Patterson of NRC and his protege Watson of IBM it has been fashionable in the US for ambitious people to arrive at work at 7am. If you pass IBM's Sydney Pagoda at 7am you will see that the practice, albeit one of gross barbarity, still flourishes in certain commercial establishments in Australia.

From that we can conclude that the Mormons in the Wicat plant had been working for 19 hours straight. How effective their work would be after that time is problematical. Perhaps they were worried about going home in that odd underwear or maybe they were trying to avoid close encounters of the Osmond kind.

We all know how persistent the average Mormon is, that is, we who live in an inner suburb do, but 19 hours straight at work is more than a little absurd. One only hopes that the Wicat quality control people work sensible hours or Lionel Singer is going to have his troubles now he's sold Prime for a fortune.

The thing is that the Wicat machines have startlingly good specifications and they are priced at an unbelievably low level. Vance Gledhill (this isn't the first time he has stepped outside the ranks of the academics into rampant capitalism), once installed an IBM 360-50 at the NSW Electricity Commission.

This machine was identical in store capacity with one of the Wicat machines on display, but not as fast. The IBM 360-50 costs more than \$600,000 with line printers. The Wicat cost around \$20,000 and sat on a rather weak looking desk. You would have been in terrible trouble due to weight and so on if you wanted to install an IBM 360-50 in the tower we were in. It's all rather confusing, isn't it? □

APPLE Corporation was deemed guilty in the New Zealand computers-for-schools dumping case. Now the computers will cost \$2020 instead of \$1200, but New Zealand master agent CED Distributors is to supply two special language packages including Pascal along with a memory card, worth around the additional \$820.

New Zealand customs don't seem to care what enhancements or additions to the Apple II are made, as long as they don't go to the schools at the original price. The extra \$820 seems to lift them over the dumping barrier.

The managing director of CED Distributors, Mr Brian Eardley Wilmot, says only a handful of cancellations have been received and that the overwhelming majority of buyers are more than pleased with the new offer.

Polycorp Holdings, the Government-sponsored manufacturer of the Polycorp CAI system, is keeping quiet in the meantime. It levelled the dumping charge, and it cannot have gained too much goodwill among prospective secondary school customers who must now dig in for another \$820.

In New Zealand there is no set budget by the Education Department for school computers. Most of the micros are bought as a result of bottle drives and parents organisation collections.

## One Brand For Schools

Meanwhile the Computer Services Division, the Government's own computer management department, has filed a 'request for information' with all the companies dealing in microcomputers whether imported or fabricated locally.

It is the preliminary to a tender for the supply of microcomputers for teaching in all the nation's secondary schools. The 'request' surprised many because it emphasised that there would be a single bulk procurement after all. The Education Department has wavered over the issue at one time claiming that it would be free choice for schools. But now it seems to have firmed up on the single source idea.

There now appear to be a number of New Zealand made computers in the running. There is the Polycorp, the Microprocessor Developments Ltd of Auckland MX Series of multiprocessors, and also the Massey University developed CAVIL for Computer Aided Video Learning.

This unusual device uses Philips VCR equipment in conjunction with microcomputers.



There is a strong degree of apprehension throughout the industry now over the outcome of the GATT decision to levy sales tax on the information on software rather than on merely the raw material itself.

In the past the formula has been to add up the cost of the plastic and the cost of putting the software on it, then include an arbitrary add-on of 100 percent of this to cover anything that might have been forgotten. The sales tax was calculated on this amount.

In New Zealand the position is all the more surprising because of the high rate of sales tax, 40 percent. If the price of the information is to be added, then it will add up to a considerable amount. Especially as the recent budget also included freight and insurance into the total sum to be levied by the 40 percent.

New Zealand Customs have never levied a sales tax on locally-made software. But this will presumably change under the weight of GATT pressure which completely forbids any preferential treatment to local suppliers.

New Zealand Customs seems to have the whole vexed question in a holding pattern pending the outcome of the appeal by the United States Government, the world's biggest software exporter, against the GATT decision.

## Computerised Job-Finding

Bookseller John Schnellenberg has introduced an online computerised employment agency to Wellington.

He is using the New Zealand Post Office's OASIS satellite link to various US databanks. Under the system qualified

applicants file their credentials and wait for the job to come up. The database employment agency is available via the link to the DIALOG information retrieval service. "New Zealanders can now regard the world as their job market", notes Schnellenberg.

Career Placement Registry is divided into two parts. One for people with some sort of university qualification, the other for 'experienced' personnel including white or blue collar workers.

A recent illustration of the potential of this online job bureau, according to Schnellenberg, concerned a Wellington company seeking a computer programmer. A five minute search of the database revealed a few appropriate people, and revealed if they wanted to live overseas.

Another interesting new release from DIALOG that Schnellenberg is using is the Electronic Yellow Pages of the United States. Eventually, the complete 9,000,000 record database will be online.

"The days of searching through bulky printed directories in strange motel rooms are now definitely over", commented Schnellenberg. "You can search from your own city."

## Confusing Shows

Are exhibitions such a good thing for the microcomputer industry?

In the last two years there has been one microcomputer fair each in Auckland and Wellington. A third is now due in Auckland. Many dealers feel that the sheer multiplicity of micros confuses prospective buyers.

"You have people going into those exhibitions who only know about Apple, Commodore and Radio Shack. They might want to buy one. Then they see perhaps 33 different brands — and they don't know what to buy."

In fact there are almost as many makes of micro in New Zealand as in Australia, and competing for a much smaller market. The population is slightly over three million.

At this year's Wellington micro exhibition Computer Consultants Ltd pointedly stayed away, issuing advertisements to the effect that people should drop by and study their micro range (OSI) in the peace of their swank offices.

## Xerox Philosophy

Paul Strassman, vice president of Xerox corporation Information Systems, had some philosophical words when he toured New Zealand in August.

---

By Peter Isaac

He was outlining the capabilities of the new Xerox 8010 Star which has a symbolic approach to office management. The Star apparently will not be released in Australia for some time. Strassman said that the western culture is primarily a 'left brain' civilisation that has emphasised the linguistic, symbolic, and analytical capabilities of the brain.

This contrasted with the 'right' brain culture of the East which had a strong visual, imaginative, relational approach with a strong emphasis on picture values. The beauty of the new approach by Star, which features symbols of things like folders, in/out baskets and filing cabinets, is that it blended the 'left' and 'right' values of brain perception.

"In Xerox I can file paper in a folder by pointing to it. I can then electronically take the folder and place it in the out basket. I can then send it to a group of people just by pointing," said Strassman.

He said that the concept of man-machine communications in Xerox was one of 'metaphor' symbols. People should not be forced to deal with the electronic medium in ways that are alien or artificial such as is the case with existing terminals, claimed Strassman.

### Pirates Supreme

Are there more software pirates per head of computing population in New Zealand than anywhere else in the world?

Chances are that this could be so. The aim around the world is to price hobby software at the point at which buying it fresh is simpler than copying it. But in New Zealand proprietary software routinely costs double or even treble the price of many countries — certainly double the price of the Australian variety.

Now there are signs that the software community is joining common cause with the people who represent the producers of video films and sound recordings. The software producers have been invited to join the Record and Video Association which represents the sound recording industry and people who produce films for VCR.

Association chairman Tim Murdoch has outlined a way of replacing the traditional royalties method of payment, a method which has now become out of date through ease of copying. He wants a lump sum tax to be applied to hardware so that it can then be held in a fund for distribution to the people who created the information — sound, visual — that people originally bought the hardware for. □

# your TI 99/4 computer

---

By Shane Andersen

---

LONG overdue, TI and Microsoft Corporation have developed a 'Visi-clone' product which will perform on the 99/4A equipped with the 32K memory expansion and disk system. This news, passed on to me by the International User Group in Oklahoma via our Melbourne branch, is very welcome!

Although the prototype version, shown at the CES, was inoperative, they had an opportunity to see Multiplan run on several other computers at NCC, said a representative of the IUG.

The Multiplan command module and diskette package is an aid for both personal and business needs, and is an extremely productive tool for data analysis. Although Multiplan will not be available until late in the fourth quarter, it is certainly a step in the right direction.

### TI-Writer

Probably the most impressive piece of software in the States at the moment (and soon to arrive down under) is a new word processing program. The TI-Writer Solid State Software word processing command module (ROM pack) was designed to provide many of the features of the larger, more complex word processing systems to users of the TI-99/4A Home Computer. This product, however, cannot be used on the 99/4.

Text editing and formatting features include inserting and deleting text and lines, automatic paragraph indentation, right margin justification, automatic word wrapping, overstriking and underlining, moving and copying text and document reformatting. The user can create, edit, save and print documents with the text editor option, in either word wrap or fixed mode.

There are a number of other features, and all in all it looks great stuff. The TI-Writer command module requires the use of the 99/4A console, a TI memory expansion unit, disk system, RS-232C interface and a compatible printer like the Epson MX-80, Microline 80 or others.

In a recent article in YC, I mentioned a number of new products such as the Editor/Assembler. However, Texas Instruments, being such an innovator, is now travelling around the US displaying a new mass storage device, a 128K memory system for the 99/4(A).

Indications are that the memory is a solid-state non-volatile disk emulator. Accessed through disk operating routines, the device can perform at three times the speed of a regular disk. Another card for the new peripheral expansion which



should be out here in the first quarter of 1983?

### Aussie Software Awards

On the 20th of this month (November), the TI Sydney Home Computer User Group is conducting a special full-day workshop event.

There are two reasons for this event: To help teach members how to write programs in BASIC, Extended BASIC, assembler and other languages; and to have a display put on by TI (Australia) of its forthcoming new products, such as the peripheral expansion box and printer.

Members will each bring their own computer system, and the more experienced members will assist the newcomers with their problems. The workshop will commence at 10 am and finish at 5.30 pm. Refreshments will be available throughout the day, and the announcement of the 1982 National 99/4(A) Aussie Software Award winners will be made.

As you may have previously read, this national competition for Australian 99/4(A) users has been running for a four or five month period, and TI (Australia) has very generously provided over \$1000 worth of prizes.

The judges for these awards were Dr John Buchanan of the University of NSW, Claudio Ellerio of Texas Instruments, Your Computer editor Les Bell, Brian Lewis of the Sydney 99/4 User Group and myself as National Coordinator.

Although judging took place on the October 30, that was just after the magazine's copy deadline, so we are unable to bring you the results. Needless to say, a good variety of software was entered from each state, and the task of judging was not expected to be an easy one. □

# your PEACH computer

By Dom Swinkels

ACCORDING to much of the advertising literature, computers should be 'friendly'. Now, I don't feel computers can either be friendly or unfriendly, but some systems are easy to use and others are not.

The term friendly has been used to describe systems — that is, hardware/software combinations — which are easier to use, because they require less memorising of commands and keystroke sequences to operate them.

## The Friendly Peach

A feature of the Peach computer which allows us to make it easier to use for a particular purpose is the inclusion of 10 programmable function (PF-) keys on the keyboard.

Each of these keys can be programmed to perform any function, which the computer is capable of at a single keystroke. Furthermore we can display on the screen what we have programmed each key to do, so that we do not have to memorise this. This makes the system easier to use and hence 'friendlier'.

Let's review the commands used to program and use the PF-keys and by examining how the information is stored in memory we will discover some things we can do that are not described in the manuals.

The PF-keys are used in two basic ways. In the command mode (that is, when no program is running) pressing a PF-key will result in up to 15 characters being entered as if we had pressed this number of keys on the keyboard. While a program is running we can use the PF-keys to interrupt the normal flow of the program and go to a subroutine to perform the task programmed there and then return to the main program.

## The PF-Key Commands

The important BASIC commands for the use of the PF-keys are:

KEY LIST

KEY n, "(string)"

on KEY n GOSUB (line number)

KEY(n) ON/OFF/STOP

The first of these typed in from the keyboard followed by RETURN (or within a program) will list the contents of all 10 PF-keys on the screen.

We can also display the contents of the PF-keys on the bottom line of the screen using the CONSOLE command. Thus, CONSOLE 0,24,1 will set the scrolling window to 24 lines starting from the top,

while the bottom line shows the contents of PF1 to PF5. If we are in 80 character width mode then up to 15 characters are displayed, while in 40 character mode only the first seven characters of each PF-key are displayed. Pressing the SHIFT key displays the contents of PF6 to PF10 in the same way.

The manual tells us that we can program each key with a string of up to 15 ASCII characters using the command KEY n, "(string)" where n=1 to 10 and (string) is any string of any length, but only the first 15 characters will be used. When we now press this PF-key it is as if we have entered this sequence of ASCII characters from the keyboard. If the string is a valid BASIC command followed by RETURN (CHR\$(13)) then the computer will execute this command.

Since the contents of the PF-keys can be programmed, this information must be stored in RAM and since on power-up the keys are already programmed with a standard set of strings this standard set must be stored in ROM and be transferred to RAM as part of the power up procedure.

Being naturally curious I wondered where in RAM and ROM this information was stored. So I wrote a short program, MEMLOOK1 shown in Listing 1, which allows 256 byte blocks of memory to be displayed on the screen in both their hexadecimal values and their ASCII equivalents.

If you run this program and enter &HC3B as the starting point, then you will see something like Table 2. This part of RAM contains the current contents of the PF-keys. If you run the memory display program again and now enter &HFD50 as the starting point, then you will see part of ROM containing the initial Microsoft message and the standard PF-key contents,

which are loaded into RAM at power up.

You might also like to start at &HA070 and see part of ROM, where all the reserved words of ROM BASIC are stored in order of their token values. They may look a little strange because the last character of each word is different. This is because bit 7 has been set to 1 to indicate the end of the reserve word.

## Fifteen-Character Limit

Being restricted to only 15 characters for each PF-key significantly limits what you can program into each key.

For example, SAVE"1:THISFILE" or LOAD"1:THATFILE" do not fit within the 15 character limit. Although these commands would work without the final double quote, it would be nice if we could also fit in the RETURN character (CHR\$(13)) which is not normally possible.

There are several ways around this. First we will consider a way which is not given in the manuals and probably was not envisaged by the programmers who developed the BASIC for this machine.

If you look at Table 2 you will see that 16 bytes are allowed in RAM for each PF-key. All unused bytes are NULL bytes. I wondered what would happen if I changed all the NULL bytes. The result was that on pressing the appropriate PF-key the system read all the characters until it encountered a NULL byte.

To test this you may want to follow these steps: Step 1. From the keyboard enter KEY 1, "ABCEFGHIJKLMNOP" and KEY 2, "QRSTUWXYZ" each followed by RETURN. If you now press PF1 then the first 15 letters of the alphabet are displayed on the screen, while PF2 will display the last 10.

The letter P has been lost because it

TABLE 2. Sample output of MEMLOOK1 program given in LISTING 1.

| Loc. | B  | C  | D  | E  | F  | 0  | 1  | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  | A  | Chararters.         |
|------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|---------------------|
| OC3. | 4C | 4F | 41 | 44 | 20 | 0D | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | LOAD .....          |
| OC4. | 3F | 44 | 41 | 54 | 45 | 24 | 2C | 54 | 49 | 4D | 45 | 24 | 0D | 00 | 00 | 00 | ?DATE\$,TIME\$..... |
| OC5. | 4B | 45 | 59 | 20 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | KEY .....           |
| OC6. | 4C | 49 | 53 | 54 | 20 | 0D | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | LIST .....          |
| OC7. | 52 | 55 | 4E | 20 | 0D | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | RUN .....           |
| OC8. | 54 | 45 | 52 | 4D | 20 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | TERM .....          |
| OC9. | 53 | 43 | 52 | 45 | 45 | 4E | 20 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | SCREEN .....        |
| OCA. | 43 | 4F | 4C | 4F | 52 | 20 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | COLOR .....         |
| OCB. | 4C | 49 | 53 | 54 | 22 | 4C | 50 | 54 | 30 | 3A | 22 | 0D | 00 | 00 | 00 | 00 | LIST"LP TO:" .....  |
| OCC. | 43 | 4F | 4E | 54 | 20 | 0D | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | CONT .....          |
| OCD. | FF | 00 | 00 | 00 | 00 | 00 | FF | 00 | 00 | 00 | 00 | 00 | FF | 00 | 00 | 00 | .....               |
| OCE. | 00 | 00 | FF | 00 | 00 | 00 | 00 | 00 | FF | 00 | 00 | 00 | 00 | 00 | FF | 00 | .....               |
| OCF. | 00 | 00 | 00 | 00 | FF | 00 | 00 | 00 | 00 | FF | 00 | 00 | 00 | 00 | 00 | 00 | .....               |
| ODO. | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | .....               |
| OD1. | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | .....               |
| OD2. | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | .....               |

was ignored during the execution of the KEY 1 command. You can verify that by running the MEMLOOK1 program. Now do step 2: Poke the ASCII code for P into the memory location at the end of PF1 in RAM containing the NULL byte. To do this enter POKE &HC4A,80 followed by RETURN. If you now press PF2 the same 10 letters are obtained but PF1 will give the entire alphabet.

KEY LIST still only shows the first 7 or 15 characters of each key contents, but it is now possible to execute several commands at a single keystroke even though together they require more than 15 characters.

There is a simpler way of doing this by programming a PF-key with GOSUB (line number) and then placing the multiple commands in the subroutine at (line number). A disadvantage of this approach is that the contents of the PF-key now no longer indicates what the result of pressing it will be, so that we are back to having to memorise this.

To overcome this we can limit the scrolling window to the top 20 lines of the screen (CONSOLE 0,20,0) and then place the message relating to each PF-key on the bottom of the screen using the LOCATE command. These can then in fact be more user-friendly than the actual contents of the PF-key. An example might be the message 'PF1- next page', while the actual contents of PF1 might be "P=P+1:SCREEN,P"+CHR\$(13).

As pointed out earlier, pressing a PF-key has the same effect as pressing a sequence of keys on the keyboard. This will therefore only have a result when input from the keyboard is possible. During the running of a program we can however use the PF-keys in a different way to interrupt the program and to re-direct the flow of program execution.

## Key Interrupts

To interrupt a running program using the PF-keys we must first use the ON KEY n GOSUB (line number) command in the program and place the sequence of commands to be executed on interruption in the subroutine starting at (line number).

Since there are 10 PF-keys we can in fact select any one of 10 program segments and each segment can be programmed to contain another 10 segments, and so on. We can then turn the ability to interrupt on (KEY(n) ON) or turn it off (KEY(n) OFF) or we can take note of the fact that the PF-key has been pressed but

stop the interrupt (KEY(n) STOP) until a convenient point in the program, where it can be executed (KEY(n) ON). The program in Listing 2 shows the various uses of the PF-key interrupt commands.

The program is somewhat trivial in that it simply draws lines on the high resolution graphics screen. However, it clearly demonstrates that you can interrupt a given task (drawing a line) and perform another task (drawing a line in a different direction) which in turn can be interrupted.

On completion of the last task, control is returned to the previous task, which is then completed, and so on. The program requires high resolution graphics, so you must execute NEW ON 7 before running it. Line 20 checks for this.

One important feature to note is that in the command mode, the PF-keys must be in the OFF state to allow their normal use to enter the string of up to 15 characters. This means that we must ensure within the program that all PF-key interrupts are turned OFF, otherwise they cannot be

## LISTING 1.

```

10 REM... "MEMLOOK1"...by Dom Swinkels.
20 REM...Look at 256 memory locations and print on screen.
30 WIDTH 80:CONSOLE0,24,1
40 INPUT "Enter memory location to start at: ";ST
50 REM...Prepare and print heading lines.
60 M=ST-256*INT(ST/256):L$="loc. "
70 FOR J=0 TO 15:M$=HEX$(M+J):M$=RIGHT$(M$,1)
80 L$=L$+M$+":":NEXT J
90 L$=L$+" Charaters.":PRINT L$
100 PRINT STRING$(72,"-")
110 REM...Read and analyse 16 lines. Print on screen.
120 FOR L=ST TO ST + 255 STEP 16
130 L$=HEX$(L):B$=""
140 IF LEN(L$)<4 THEN L$="0"+L$:GOTO140
150 L$=LEFT$(L$,3)+"."
160 FOR J=L TO L+15
170 M=PEEK(J):M$=HEX$(M)
180 IF LEN(M$)<2 THEN M$="0"+M$
190 L$=L$+M$+":"
200 IF M<31 OR M=255 THEN A$=".":ELSE A$=CHR$(M)
210 B$=B$+A$":NEXT J
220 PRINT L$;" ";B$":NEXT L
230 REM...Next block or finish ?
240 ST=ST+256
250 PRINT:PRINT:INPUT "NEXT BLOCK OR FINISH (N/F) ";A$
260 IF LEFT$(A$,1)="N" THEN GOTO 50
270 END

```

## LISTING 2.

```

10 REM...PF-KEYS...by Dom Swinkels.
20 IF PEEK(29)<>75 THEN NEW ON 7
30 CONSOLE0,24,0:CLS:COLOR7
40 PRINT"The standard PF-key contents loaded at power up are.":PRINT
50 KEY LIST

```

used at all in the command mode.

The RUN command will set all PF-interrupts to OFF so that each program starts with all interrupts off. However, even a normal exit from a program via an END statement does not turn OFF any interrupts left ON within the program.

When you have made provision within the program to turn all interrupts OFF in the course of a normal exit, you may still have a problem when an error causes the program to terminate.

You then have two ways of turning the interrupts off. One way is to type in the KEY(n) OFF command for each key left on. This may be a bit slow when several PF-key interrupts were left on or if you do not know which ones might have been on.

The other and faster way is to type in RUN (line number) where (line number) is the number of a program line containing only the END command. The RUN command will turn all PF-key interrupts off and the END command will immediately terminate the running of the program.



## APPLE COMPUTER COURSES

City Personal Computers is introducing a series of computer courses designed for the business and personal Apple user. Courses to be available are:

- ★ VISICALC
- ★ ADVANCED VISICALC
- ★ ADVANCED APPLESOFT PROGRAMMING
- ★ INTRODUCING APPLE ASSEMBLY LANGUAGE PROGRAMMING

The first of these is designed to enhance the Visicalc users knowledge and use of this most useful of business programs.

A prospectus on the courses will be sent to you if you return the coupon to either of our stores.

Return to:

City Personal Computers  
5/385 Pacific Highway,  
Crows Nest 2065

Please send a course prospectus to:

Name:.....

Address:.....

..... Postcode:.....

\*I own an Apple II/Apple III

\*Delete where applicable.



```

60 ON KEY (1) GOSUB 2000
70 ON KEY (2) GOSUB 3000
80 ON KEY (3) GOSUB 4000
90 ON KEY (4) GOSUB 5000
100 ON KEY (5) GOSUB 6000
110 KEY (1) ON
120 CONSOLE 0,24,1:LOCATE 0,15
130 PRINT"The contents of the PF-keys are also shown on the bottom line using"
140 PRINT"CONSOLE 0,24,1. Press SHIFT to see PF6 to PF10.":PRINT
150 PRINT"These contents of the PF-keys can only be used in the command mode."
160 PRINT"This program is now running and the only PF-key turned on is PF1."
170 REM...Loop here until interrupted.
180 LOCATE 0,23:PRINT TIME$;" Press Z to exit.";
190 A$=INKEY$:IF A$<>"Z" THEN GOTO 170
200 RUN 210:REM..This turns all PF-keys OFF.
210 END
2000 REM...Clear the screen, print PF-key labels and turn interrupts on.
2010 CONSOLE 0,24,0:CLS:COLOR 11
2020 LOCATE 0,25:PRINT" PF1-CLEAR SCREEN ";
2030 LOCATE 22,25:PRINT" PF2-UP ";
2040 LOCATE 35,25:PRINT" PF3-DOWN ";
2050 LOCATE 50,25:PRINT" PF4-LEFT ";
2060 LOCATE 65,25:PRINT" PF5-RIGHT ";:COLOR7
2070 KEY (2)ON:KEY (3)ON:KEY (4)ON:KEY (5)ON
2080 COLOR7:X=320:Y=100:PSET(X,Y):RETURN
3000 REM...Move up routine.
3010 L1=L1+30:FOR UP=1 TO L1:Y=Y-1:GOSUB 7000:NEXT UP:L1=0
3020 RETURN
4000 REM...Move down routine.
4010 L2=L2+30:FOR DOWN=1 TO L2:Y=Y+1:GOSUB 7000:NEXT DOWN:L2=0
4020 RETURN
5000 REM...Move left routine.
5010 L3=L3+30:FOR LEFT=1 TO L3:X=X-1:GOSUB 7000:NEXT LEFT:L3=0
5020 RETURN
6000 REM...Move right routine.
6010 L4=L4+30:FOR RIGHT=1 TO L4:X=X+1:GOSUB 7000:NEXT RIGHT:L4=0
6020 RETURN
7000 REM...Drawing routine.
7010 KEY(2)STOP:KEY(3)STOP:KEY(4)STOP:KEY(5)STOP
7020 IF Y<0 THEN Y=183
7030 IF Y>183 THEN Y=0
7040 IF X<0 THEN X=639
7050 IF X>639 THEN X=0
7060 PSET(X,Y)
7070 KEY (2)ON:KEY (3)ON:KEY (4)ON:KEY (5)ON
7080 RETURN

```

## READER'S CARTOONS

Cartoon by Craig Delahoy



# free readers' classifieds\*

**FREE CLASSIFIEDS:** are for readers only, not commercial organisations. Classifieds of 20 words or less accepted free of charge; for classifieds of more than 20 words the first 20 words are free, then it's 20 cents a word.

Black and white prints may be included if suitable for publication, and will be charged for at \$10 each photograph.

More than one ad in one issue will be treated as a single ad and charged accordingly.

**COMMERCIAL RATE:** Minimum 20 words, at 35 cents a word. Photographs \$20 each.

PRINT or type your ad clearly and legibly, double-spaced, and include separately your name, address and phone number for our records or checking purposes even if these details aren't all to be included in your ad.

**Send It to Your Computer Readers' Classifieds,  
PO Box 21, Waterloo, NSW 2017.**

**Paddles for Vic 20:** Tested paddles for half price!! Price \$25.00 + \$2.00 p.p. to order send check/mail order to V.I.P. Hardware, 34 Knights Road, Galston, N.S.W. 2159. (Enquiries welcome.)

**TRS-80:** Model I Level II + Monitor + over 40 games. The lot for only \$700.00. Phone (03) 560 8629 after 7pm.

**Wanted:** Cassette based Disassembler and WP programs for 16K MicroBee. Write to A. Vennonen, 3 Simpson street, Watson, A.C.T. 2602.

**ZX81:** Adapter, cassette recorder, cassettes, leads, and two books. \$180. Write to R. Hooper, 25 Robson Street, Kilcoy, Qld 4515.

**Commodore:** 8032/8060 32K/1Mb, 80 cps 4022P Printer, bought September, must sell. \$5500 with WordPro, VisiCalc, Toolkit, games. Phone Steve a/h 389 1199, b/h 29 5791.

**Sell:** Sharp PC 1211 Pocket Computer and cassette interface, all manuals. \$190. Phone Andrew (02) 419 7993 a/h.

**TI-59 Calculator:** and PC-100C Printer for sale with all literature, charger etc. As new condition, \$350 o.n.o. Phone (02) 398 6961.

**Must Sell:** Sorcerer 48K, monitor, cassette and DP8000 Printer. Dozens programs and W.P. Pak, DEVPak, Chess, Forth, etc, etc. \$1390 o.n.o. Phone (045) 77 3624.

**ZX-81:** 1K-16K programs include File, Othello. Send S.S.A.E. for price list to David Noble, 34 Murri Street, Blackheath, N.S.W. 2785.

**MicroBee:** Speed up kit, send \$8.00 inc. p/p to: L Latemore, PO Box 704, Sale, Vic. 3850. Ph (051) 44 2011. All parts and full instructions included.

**For Sale:** Tandy Pocket Computer with cassette interface and listing of two games. \$200. Ph. Steven (02) 607 3481.

**Sorcerer 32K:** Devpac, manuals, software. \$750 o.n.o. Godbout XX S100 32K Static RAM \$250. Hazeltine terminal \$100. Terry (02) 682 4649 a/h.

**PC1500:** With Printer and manuals, only 9 months old, suit beginner, cost \$570 will sell \$520. Still under warranty. Phone (07) 30 3314.

**MicroBee 16K:** Fully assembled, all manuals, software tape, plus 6 blanks. \$420. Terry (02) 623 1583 or b/h (047) 39 6102.

**Wanted:** Sinclair ZX-81 software to sell/swap. Second-hand keyboard + printer + unwanted, cheap books etc. P Carswell, 22 Brand Street, Bundaberg, 4670,

**ZX-81:** 16K RAM 8K ROM + lots of tapes and books, \$350 o.n.o. Ph (02) 498 3762 or write Ian Newman, 97 Springdale Road, Killara, NSW, 2071.

**Transforth II:** for Apple as new. Only \$100. Joe Rezabek Ph (02) 644 1272 or a/h (046) 26 7794.

**Members Wanted:** for the CBM/VIC Users Group N.T. For details contact Ian Diss (089) 27 9208.

**For Sale:** Vision-80 \$260, Enhancer II \$150, Typing Tutor \$20, Utility City \$25, Alpha Plot \$35, Aristotles Apple \$30.

Original documentation. Ph (069) 22 5451.

**Wanted:** System-80 or TRS-80 games software and TRS-80 manuals. Kevin Leong, PO Box 47, Rockdale, NSW, 2216.

**ZX-81 Programs:** 14 1K listed programs. Quality tape. Breakout, Bathurst, etc. \$9. Lightning Software, 11 Mara Place, West Lakes, S.A. 5021.

**Sharp Pocket Computer:** PC1211 with Printer, cassette interface, vinyl case and extras. As new \$280. Phone (02) 621 8397.

**Sell:** TRS-80 games Nove, Galaxy, Cosmic, Attack, Edtasm+, Advent, Crowley, A.T.C. etc half cost o.n.o. David Brighton, Franklin Road, Huonville, Tas 7109.

**Sell:** Sorcerer programs, original tapes. Super Asteroids, Grotnik Wars, Bruce Chess game, Adventures 1, 7 and 8 and Touch Type Tutor. \$10 each. Cook, PO Box 95, St Marys, Tas 7215. Phone (003) 72 2111 b/h before 3pm.

**TRS-80:** Colour Computer complete with 16K RAM, CTR-80A cassette recorder, Joystick, manual and game, must sell. \$550. Phone (02) 661 3202.

**Students Wanted:** For club over Australia. Details write to WonTek, 35 Griffiths Street, Wonthaggi, Vic 3995. Phone (056) 72 1381.

**Games:** For the Apple II ... All types. Write for catalogue ... Ban-Pit, 79 Lakeside Ave., Mount Beauty, Vic 3699. Or phone (057) 57 2097 (after 4).

# your ZX81 computer

By David Brudenall

IT IS interesting that Sinclair Research is promoting the new Spectrum as a direct competitor to the BBC micro.

Its advertising literature virtually claims the Spectrum is as good as, or better than, the BBC micro, but at a far lesser cost. The Spectrum is a nice machine, but it is not as good overall as the BBC machine.

The BBC micro, for instance, has higher resolution graphics, better sound, and a better keyboard. By now most of you would have heard the story that the most popular name for the Spectrum in the Sinclair Research office was "Not the BBC Micro!".

What all this is getting to is that this marketing strategy by Sinclair is rather irresponsible. People who can afford to buy a BBC machine but opt for the Spectrum instead will be missing out on some nice BBC features. For people who can only afford the Spectrum, however, it is a worthwhile machine.

The Spectrum is going to become a

very popular micro and will be quite adequately supported with software and hardware. Already the advertisements from Spectrum software vendors are appearing in the UK magazines.

Evidently the biggest problem with the Spectrum is its speed. It is still only as fast as the ZX81 in fast mode, and that isn't very fast when compared to other micros. The Spectrum's sound abilities aren't all that hot either. The sound is very quiet and the Spectrum cannot do anything else while it is BEEPing.

Nevertheless, I like the look of the Spectrum, and perhaps I will even get one eventually!

## PEEK and POKE

PEEK and POKE are two of the functions which the newcomer to computing has the most trouble understanding.

I know when I was starting out with computing I often wondered just what PEEK and POKE were, and what they could

actually do for me. The truth is that quite often PEEKing and POKEing isn't necessary for many applications.

ZX81 statements like PRINT AT and PLOT can reduce the need for POKEing onto the screen most of the time. However, there are those occasions where PEEKs and POKEs are desirable or a necessity.

Here are two useful PEEK routines for the ZX81 owner. These are byte-counters (they print the amount of memory used up by your program not counting the PEEK routine itself).

To use it, simply type it in at line 9999, then if you want to see how much RAM your program has consumed, use RUN 9999 or GOTO 9999.

Byte-counter for ZX81 with 1K RAM:

```
9999 PRINT PEEK 16400 + PEEK 16401  
* 256 — 16587
```

Byte-counter for ZX81 with 16K RAM:

## ZX81 & Spectrum software

GULP II taking the ZX81 community by storm. a high speed game of chase, capture and evasion. 15 different mazes, 9 speeds and levels of difficulty, laser defence, bonus sets. High speed machine code, no flicker graphics.

Also available for spectrum with full colour and sound.

16K ZX81 : \$15.95      Spectrum \$19.95

DATABASE a machine code program for storing names, addresses, interest codes, text. Mailing list printout, various display formats available. 12688 bytes of file space available on 16K. Useable up to 64K ram. Full user instructions. \$15.95

THE FAST ONE a development from DATABASE we kept the best of DATABASE and adds a host of extras....

★ Up to 36 user defined items per record

★ Layered file search

★ Multiple user defined report formats

★ Huge choice of style

★ 1 to 19 Records displayed sorted by ANY variable

★ Scrolling and print options

★ Numeric totals and averages

★ 11700 Bytes of file space on 16K ram, up to 50000bytes on 64K ram

Dr. I. Logan reviews TFO: "immensely versatile, fantastic in its elegance, sheer speed, ease of use. A pleasure to use seriously as well as being an object of study." The cassette includes a realistic example file. Accompanied by a detailed manual. Only \$25.00

Send cheque or postal note to:  
**CAMEO ELECTRONICS**  
1st Floor, 86A Barrack Street,  
Perth W.A. 6000

Sydney Centre  
of Learning  
for Adults

### Residential Summer School

Mitchell College, Bathurst

January 8-15, 1983

## COMPUTER CLASSES Introduction to Microcomputers

If you want to find out about all aspects of microcomputers — how they work, how to program and what you can do with them at home, work or school — then come along to our week long, intensive course designed for beginners.

The class will have 10 Apple computers to get "hands on" experience.

Enrol early because the class is limited to 20 students.

For details and free brochure, write to

The Secretary  
SCOLA  
P.O. Box k705  
Haymarket 2000  
or phone (02) 371-8197

9999 PRINT PEEK 16400 + PEEK 16401  
\* 256 — 17355

These routines also work with the 8K ROM ZX81.

### What's a USR?

Just what is USR? USR is a function used to activate machine code routines from BASIC. Don't worry too much about USR unless you already know something about machine code.

There is one peculiar little USR routine which is quite interesting. If you have a RAM pack fitted you might like to try this:

PRINT USR 1012

High-res graphics! That USR command just wrecked up the entire character set, but don't worry, type in NEW and press N/L and everything will be restored.

Unfortunately the display won't reproduce on the printer, which would be nice.

While USR 1012 is activated you can type in simple programs like 10 PRINT '(any characters)'; 20 GOTO 10 (even though you can't actually read what you're typing in), and when RUN you should get some interesting patterns! When PRINT USR 1012 is activated everything in RAM is cleared so it's no use typing in the simple pattern programs beforehand!

In a future column I will be explaining PEEKing and POKEing to the screen in more depth, and will suggest some potential applications (games are the most common use) for such POKEs and PEEKs.

### ZX81 Crash Cures

AZUA member Byron Wetton reports that some ZX81 crashes are caused by vertically mounted resistors on the ZX81 printed circuit board touching the conductive surface on the underside of the top half of the ZX81 case.

To cure these crashes you have to take

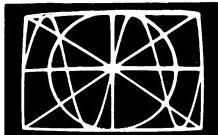
your ZX81 apart (there are screws hidden under the rubber feet on the bottom of the ZX81), and insulate the underside of the top half of the case with plastic tape.

Another AZUA member, Jim Gray, reports that Sinclair UK has claimed that RAM pack crashes can be cured by applying lubrication to the ZX edge connector. Try cleaning the edge connector with methylated spirits, then apply some vaseline to both the top and the bottom of the edge connector. Jim says it worked for him!

While mentioning AZUA members, why not a plug for AZUA too? If you want to become a part of the highly acclaimed Australian ZX Users' Association (AZUA), send a 40 cent stamp (for our free introductory newsletter) to: AZUA, 19 Godfrey Street, Campbell ACT, 2601. AZUA's subscriptions have unfortunately had to rise to \$12, or \$7 for 6 months, but it's still the cheapest ZX club in Australia (as far as we know, anyway!). □

## SUPEREZ-80

HI-RESOLUTION GRAPHICS  
FOR THE TRS-80 & SYSTEM-80



Introducing SUPEREZ-80, the ultimate in high resolution graphics with world first features. Installs out of sight within the computer to give true 384H x 192V independent pixel resolution, each being individually addressable, thus SUPEREZ-80 is not repeat NOT a programmable character generator system (such systems suffer seriously in complex screen graphics applications).

SUPEREZ-80 does NOT use any precious main memory and yet an extra 16K becomes available (using the bank select technique as used in minicomputers along with Tri-multiplexing) allowing multiple intermixable operational modes including high resolution of any screen location whilst any others are 'normal' alphanumeric or low resolution characters, thus P.C.G. mode operation is possible if required; Page mode operation is supported where 16 independent video pages are available and by sequentially 'switching' each page to the screen, complex real time animation is feasible at rates up to the 1000's of frames per second.

Programming SUPEREZ-80 is as simple as the SET/RESET/POINT statements but FASTER.

For other products and services we provide, see page 73 of this magazine.

### C.P.U. APPLICATIONS

SEND S.A.E. FOR FREE BROCHURE



PO Box W116 WARRINGAH MALL 2100  
650 PITTWATER RD, BROOKVALE  
PHONE: (02) 93-5561



## sinclair SOFTWARE for ZX81



### BONUS CERTIFICATE REDEEMABLE ON ANY PROGRAMME

- BUSINESS
- EDUCATIONAL
- GAMES
- PROGRAMMING AIDS
- HARDWARE
- IMPORTS

(incl: Keyboards, Memories)

Send S.A.E. for your comprehensive catalogue and bonus certificate to:

**G. S. WEBBER  
& ASSOCIATES**

P.O. BOX 238  
GYMEA 2227



100% GUARANTEE • SUPER COMPETITIVE PRICES

# your MICROBEE computer

by Richard Pakalnis

I POPPED into Applied Technology's showroom at Waitara the other day so I could pick someone's brain and supply you with some real, interesting and useful informative stuff instead of my normally introverted ego bash.

Remember last month when I finished off with the self test facility? I do believe some of you have had trouble getting it up on the screen. Don't despair. It's just a matter of dexterous skill. Press RESET and hold it down. While holding down RESET, press 'S' and hold it down. Sing Waltzing Mat...No. Don't do that. Now release RESET (still holding 'S' down) and voila! On screen will appear the word 'KEYBOARD'.

This is the keyboard test. Starting at the ESC key working from left to right, press each key in turn, using your normal pressure, to BACKSPACE; TAB through to RETURN and so on. Keep in sequence and don't hit two keys at once. The last key you hit is the SPACE BAR. If your keyboard is operating correctly a tick will appear and the MicroBee will go on to test the ROM and RAM packs and your other bits and pieces which are described on screen.

But what's this? Cassette and RS 232 are (X)'d. Just take your cassette plugs and short them across each other. Same for the RS 232. Bit of a fiddle but worth it if you're suffering from data transfer problems.

Cold starts seem to be a digital exercise for some as well. (Hold it. I know what you're thinking!) Press RESET down and hold it. Press ESC and hold it. Release RESET. BEEP! Your MicroBee is naked once again.

## Micropolis Who?

Contrary to popular belief, the Micropolis disk drive will not be promoted as the MicroBee's major peripheral. The MPI-52 (Micro Peripherals Inc) has been chosen and will take a double sided 250K unformatted 13cm double density floppy. Price? By itself \$549. That's not bad in today's money.

To save you a phone call, here is the absolute, most up-to-date price list (effective 9th September, 1982) so you can buy more wings for the Bee: S100 Interface/Cabinet, \$299; Disk Drive, FDC, CPM 2.2, \$799; Add-on Disk Drive, \$549; MicroBee Conversion 16-32K, \$100; MicroBee Conversion 32-64K, \$155; Kaga Monitor, \$299; Black & White Monitor, \$139. Software in ROM: MicroBee Editor Assembler, \$49; MicroBee 5.1 BASIC Update, 92

\$20; MicroBee CP/M 2.2 on disk, \$200.

## Graphics

Some good news for those who want to know all about programmable character generators but were afraid to ask.

Very shortly a tape will be released by Applied Technology which will be a teaching aid in PCG and Graphics Editing. Now don't start dashing for the phone and ask when it will be ready. Believe me, I'll let you all know when to place your orders. It's a few months yet. I'll review it as soon as it's available...

I wonder who out there picked the typographical error in the manual (the new spiral bound one) referring to the PCG Car Graphics. Page 106. Program line 140.

140 PRINT "LOOK....";GOSUB [Z] 2000 etc.

Anthony Callinan from Applied Technology asked me to apologise on their behalf. The semi-colon (:) should be a colon (:). If you're a budding programmer you don't need error messages this early in your career. You may say it's only a small thing but it's shown they care.

For those of you who are waiting for their new cases (and those of you waiting for their new MicroBees), please don't worry. I've been assured the Queen Bees at Gosford have been working their little wings off to get those back orders out to you all. They are on their way and will be with you soon. I've been waiting for mine, too.

Power pack problems seem to have cropped up around town. Some of them get so hot they melt the solder on the power rail. The problem is being addressed and the lookout is on for a new supplier. An Australian supplier I might add. You're Australian, we're Australian, Applied Technology is fiercely Australian. Buy Australian. Good on yer! (You told me you were Lithuanian — Ed)

## Tutorials For Teachers

This is a message to all teachers who have been, or are about to be, involved in education with the MicroBee.

Applied Technology will be starting, very shortly, Tutorials For Teachers so that they can get the best possible use out of the MicroBee.

Completely without permission I'd like to reprint some copy from 'Microworld Report' which was issued earlier this year.

It said "...our major market objective for

the MicroBee was to produce a powerful, cost effective computer for the educational market.' The article went on to say sponsors had collectively contributed \$120,000 to a fund to produce software and other support for the MicroBee in Educational applications. There are over 500 programs ranging from music lessons, the arts and typing skills to fundamental mathematics instruction. So teacher — be ready and don't be another brick in the wall.

Enough of this serious stuff. It's game time. I got away with a swag of game tapes while visiting the Hive at Waitara. I've spent a lot of time trying to figure out which one to load first... Think... Think... Concen... Yes, of course...

## Concentration

The game of Concentration (anybody out there old enough to remember Terry Dear?) is a memory game which can be played by up to four people. The MicroBee can be one of the players if you wish.

The graphics in high resolution are excellent by the way. The screen displays 60 cards numbered from 1 to 60. There are picture cards laid face down and you have to match a pair. Different cards have different points allotted. There is a degree of difficulty from 0-9 and the higher the difficulty the better the computer memory of cards previously turned.

With four players and a cask of Kilawarra Cabernet Sauvignon you soon forget whose turn it is, without trying to remember what cards are where. No problem. Names are input at the beginning of the game and each player is prompted and scores are kept.

If your girlfriend has left you because you glow in the dark, type in Merlin or Merle and you play the Bee. I like the game. Well worth \$7.95. What I don't like is the way it shows how my memory has been eroded by all this booze. I haven't gone past 0 yet!

## Anybody Out There?

I don't want to seem picky but my fellow columnists seem to get mail from their readers. I feel quite inadequate not getting reader/user suggestions (be careful — I'm quite big).

If you've done something extraordinary with your MicroBee or done something really dumb, write to me c/- Waterloo (or it really will be my Waterloo) and tell me about it. This column is for you so use it up. □

# COSMIC SOFTWARE

ARCADE FAVOURITES FOR THE TRS-80 AND THE SYSTEM 80.

- \* ★ SPECTACULAR FAST MOVING MACHINE LANGUAGE ACTION
- \* ★ ALL WITH SOUND AND GREAT ANIMATED GRAPHICS
- \* ★ ALL PROGRAMS HAVE FULLY GUARANTEED WARRANTY

## AVAILABLE FROM

Micro Base Computers  
422 Newcastle St.,  
West Perth, W.A. 6005.  
Ph: (09) 328-9308

Sea Horse Computers  
10 Mitchell St  
Camden, NSW.  
Ph: (046) 66 6406

City Personal Computer  
75 Castlereagh St  
Sydney, 2000.  
Ph: (02) 233 8992.

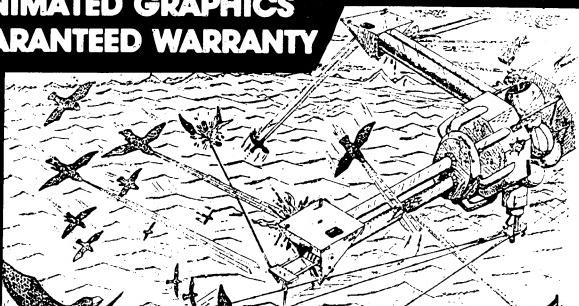
Software-80  
Shop 11/200 Moggill Rd  
Taringa, Brisbane.  
Ph: (07) 371 6996.

Computer Campus Pty Ltd  
11 Rundle St  
Kent Town, 5067.  
Ph: (08) 42 4826.

DeForest Software  
26 Station St  
Nunawading, 3131.  
Ph: (03) 877 6946

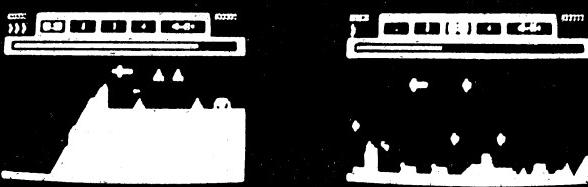
### ★ STAR CRESTA ★

Blast the Falcon Fighters and Firebirds to pieces.  
Can the PHOENIX reach the Empress and smash her to atoms? Great sound effects with battleship.



### ★ DEFENCE PENETRATOR ★

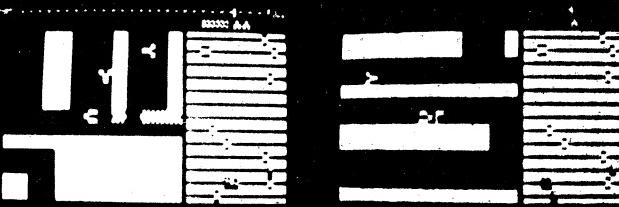
Can you infiltrate enemy territory and destroy the Command Base or will they SCRAMBLE our universe?  
Aliens, Meteor Storms, Missiles and Artillery installations will try to destroy you. Smooth realistic scrolling planetscape.



MISSILES!! METEORS!!

### ★ RALLY RACER ★

Drive through an action packed maze and try to hit all the flags before Morgan, the mad motorist, or Crazy Harry and his killer hooligans catch you!



### ★ STELLAR WARP ★

Your craft is armed to the rim with fearsome firepower, as aliens attempt to destroy you, your finger itches to use the ultimate weapon — Stellar Warp.

Post to: COSMIC SOFTWARE  
G.P.O. Box 3494, SYDNEY N.S.W. 2001



Trade enquiries welcome

NAME.....

ADDRESS.....

..... Enclosed \$..... Bankcard/Cheque/Money Order

Expiry Date:.....

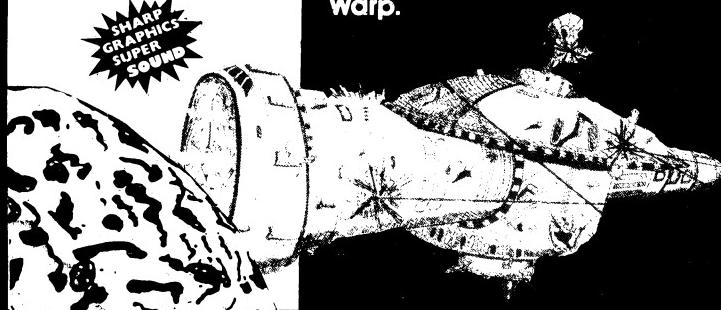
Bankcard Number:.....

Signature.....

| ITEM               | QTY | \$ PRICE EACH | AMOUNT | C |
|--------------------|-----|---------------|--------|---|
| STAR CRESTA        |     | 19.50         |        |   |
| DEFENCE PENETRATOR |     | 19.50         |        |   |
| RALLY RACER        |     | 19.50         |        |   |
| STELLAR WARP       |     | 19.50         |        |   |
|                    |     |               | TOTAL  |   |

WE SET THE STANDARD OTHERS FOLLOW.

SHARP  
GRAPHICS  
SUPER  
SOUND



# your computer glossary

**Absolute:** Located at a fixed address in memory.

**Access:** To read or write from a location in memory, or a file, or disk.

**Accumulator:** The major register of a CPU, in which arithmetic and logical functions are performed. Some computers have several registers which can function as accumulators; in others some registers can perform a subset of the full set of operations.

**Address:** A memory location which can contain data or an instruction.

**Algol:** Algorithmic Language, an early computer programming language for mathematical applications. Widely used in Europe, embodied early structured programming concepts and was a precursor of Pascal.

**Algorithm:** A set of instructions which define a method of obtaining some result (usually mathematical). A cooking recipe is an algorithm, as is a knitting pattern.

**Alphanumeric:** Composed of either letters or numbers or both.

**Analogue (Analog):** Representation of a value by a voltage or some other measurable datum, rather than a binary or other representation based on counting.

**Apple:** The Apple 11 computer is a computer based on the 6502 microprocessor with an integrated keyboard. Noted for its colour graphics capabilities, which make it popular with schools.

**Application:** What you do with your computer.

**Array:** A set of values under a common variable name, which are accessed through a subscript. For example A[1] is the first item in array A, A[2] is the second, etc. A[N] is the Nth item.

**ASM:** Assembler. also a suffix added to assembly language file names to distinguish them from other files with the same name.

**Assembler:** A program which converts assembly language into its corresponding machine (or object) code, which can be executed by the computer.

**Assembly Language:** A language in which each machine code instruction is represented by a short mnemonic which is much more comprehensible to the programmer. For example, the 8080 machine code

[10010110]  
in binary, is  
[SUB L]

(subtract L from accumulator) in assembly language. Each line of assembly language becomes one machine instruction.

**Assign:** To make one thing equal to another, e.g. [A = B] assigns the value of B to A.

**Atom:** An indivisible component of a data structure.

**Attribute:** A property possessed by some object, such as a file. Often attributes take the form of restrictions, such as a file being read-only.

**Backup:** An extra copy of a disk, tape or file taken as a precaution against damage of the original.

**Backus Normal form:** A special language (a metalanguage) used to describe precisely the grammatical rules of another language.

**Base:** The lowest number inexpressible in a given number system.

**BASIC:** Beginners All-purpose Symbolic Instruction Code. Invented in 1970 at Dartmouth College By Kemeny and Kurtz as a teaching language, it has since been enhanced in its more exotic forms into one of the most sophisticated yet easy-to-use languages available on personal computers. Its major rival is Pascal, which has the added virtue of stressing structured program design.

**BDOS:** Basic Disk Operating System. The major functional component of the CP/M DOS.

**Binary:** The system of counting in 1s and 0s used by all digital computers.

**Binary Search:** A method of searching for an entry in a table by successively halving the table until all that's left is the desired entry.

**Binary Tree:** A form of data structure in which entries are tagged on at the end of the appropriate branches.

**BIOS:** Basic Input/Output System. The part of the CP/M operating system which is different for each machine and provides any special I/O routines for disks, terminal, printer, etc.

**Bit:** Binary Digit. Either 1 or 0.

**Boot:** To load the operating system into the computer from a disk or tape, either initially or subsequently after running a program.

**Bootstrap:** To use one short program to load a longer loader program which then loads the operating system.

**Branch Instruction:** A program instruction which causes the computer to jump to another instruction, usually fairly close by.

**Buffer:** An area of memory used for temporary storage while transferring data to or from a peripheral such as a printer or a disk drive.

**Bug:** an error in a program. Makes programmers itch.

**Bus:** A set of wires over which, data, addresses, or control signals are transferred between the central processor and memory or I/O devices.

**Byte:** A computer word eight bits wide. A byte in memory can hold a character or a binary number between zero and 255 (or — 128 and 127), or a computer instruction.

**C:** A programming language, developed at Bell Labs, which is particularly convenient for writing system utility programs.

**Case Statement:** An instruction found in some high level languages which allows control to pass to one of several subroutines depending on the value of a variable. For example, the BASIC statement

ON X GOSUB 100, 200, 300

will jump to line 100 if X = 1, 200 if X = 2, 300 if X = 3.

**Call:** A jump to a subroutine which leaves the return address on the microprocessor stack, so that when the subroutine is finished executing, control returns to where it left off.

**CBASIC:** A commercial version of the BASIC language, running under the CP/M operating system. Doesn't use line numbers on every line, and is compiled, rather than interpreted like Microsoft BASIC.

**CCP:** Console Command Processor. The part of the CP/M operating system that reads a command line and sorts out what it means.

**Chain:** To automatically run one program after another.

**Character:** A letter or number, or in some circumstances, a control code such as "carriage return".

**Checksum:** A running total of the characters in a file, recorded or transmitted with the file so that errors can be detected.

**Code:**

Absolute: Machine instructions which are intended to be loaded and executed in a particular area of memory.

Object: Machine instructions, as distinct from the source code from which it was generated.

Reentrant: Code which can be used by several users at once, keeping separate variables for each.

Relocatable: Code which can be loaded and run anywhere in the computer's memory.

Source code: A program written in assembler, or a high level language such as BASIC, which must then be assembled or compiled to produce the object code which can actually be executed.

**Cold Boot:** To start up a system from scratch, loading the operating system from disk or tape.

**Cold Start:** See Cold Boot.

**COM file:** In CP/M parlance a command file, that is, a machine code program that can actually be run.

**Command:** An instruction from the console for the system to do something.

**Comment:** A note added into a program to help the reader (or programmer) to understand its operation. Does not affect the program's execution in any way.

**Compiler:** A program which accepts as input a source file written in a high level language, and produces as output an object file containing the machine instructions which are actually executed.

**Computer:** Are you serious?

**Concatenate:** To join two strings together, one after the other.

**Conditional:** A test; for example, is X greater than Y: IF X is greater than Y THEN GOSUB 500 (BASIC)

or, if the carry flag is set, jump to location NEXDIG:

JC NEXDIG (Assembler)

Conditionals are one of the most powerful features of any computer language.

**Console:** The keyboard and screen from which the operator controls the computer.

**Control characters:** Codes which perform functions like acknowledging correct receipt of a message or requesting retransmission of an erroneous message. Control characters are defined as part of the ASCII and similar codes.

**Copy:** To duplicate, usually for backup safety.

**CP/M:** A disk operating system for 8080 and Z80 based microcomputers. Allows the user to store information and programs in named files, as well as managing disk storage and input/output functions. Other disk operating systems include TRSDOS (on TRS-80) and DOS 3.3 (for Apple).

**CRT:** Cathode Ray Tube. Usually refers to the screen of a video terminal or the terminal itself.

**Data:** Information to be processed by, or output from, a program.

**DDT:** Dynamic Debug Tool. A program that assists the user to find errors in machine code programs.

**Debug:** To locate and fix errors.

**Decimal:** Based on ten.

**Delete:** To erase.

**Device:** A piece of equipment such as a printer or tape drive which the computer uses.

**Directory:** A list of the programs on a disk (or occasionally tape) together with necessary information, such as length and location.

**Disc:** A flat, circular magnetic surface on which the computer can store and retrieve data and programs. Is fast compared with tape, particularly when access is not one item after another.

**Disk drive:** The mechanical assembly which rotates the disk and positions the read/write head.

**Disk Operating System:** A program which operates one or more disk drives automatically and manages the system.

**Display:** The computer's output device at the console, usually a TV-like display of letters and numbers; sometimes the computer can draw on the display.

**Double Density:** A method of recording twice as much information on a floppy disk.

**Dump:** To list out the contents of memory or a disk.

**Echo:** When the computer inputs a character from the keyboard, it then sends it back to the display so that you can see it was received correctly.

**ED:** An editor program; part of CP/M.

**Editor:** A program which lets you alter and correct source files and other documents.

**Erase:** See delete.

**Error Message:** Tells you something went

wrong, and sometimes what.

**Execute:** To run a program; to follow its instructions.

**FIFO:** First in, first out.

**File:** A continuous collection of characters (or bytes) saved on a disk or tape for later reloading.

**Fixed Point:** Counting in integers only. Usually limited to small values, and restricted in accuracy, giving rise to ridiculous answers such as  $9/5 = 1$ .

**Flag:** A variable, sometimes a single bit, which can have only two values, used to indicate some condition.

**Floating point:** The kind of arithmetic used in scientific calculators.

**Floppy disk:** A disk, made of thin flexible mylar, and enclosed in a card jacket, which can be used for magnetic storage. There are two varieties; eight inch and 5½ inch. These can typically store somewhere between 140,000 and 3 million bytes (characters).

**Focal:** Formula Calculator. A simple language, rather like a small BASIC, found on some mini and microcomputers.

**FORTRAN:** Formula Translation. One of the first computer languages, and beginning to show it.

**Function:** A sub-program that processes variables in some well-defined way.

**Garbage Collection:** The process of going through memory or disk space, reclaiming all the unused space.

**Global:** A variable which is known to all the parts of a program. See local.

**Grammar:** The formal rules of a language.

**Hard Disk:** A disk made of hard material, larger, faster and more fragile than a floppy disk, and capable of storing 70 million bytes or more.

**Hard Copy:** Printout.

**Hardware:** The bits of a computer you can kick, as opposed to the programs you can only swear at.

**Hashing:** A method of reducing the size of a table which otherwise would have mostly empty entries.

**Hexadecimal:** The method of counting to the base sixteen. Or the method of splitting binary digits into groups of four, which is the same thing. In hex, you count: 0 1 2 3 4 5 6 7 8 9 A B C D E F 10 11 12 13 14 15 16 17 18 19 1A 1B 1C 1D 1E 1F 20 21 22...

**Identifier:** A label, or the name of a variable.

**Iff:** If and only if.

**Index:** A variable which usually points to an entry in a table or list.

**Index Register:** A processor register which is used to access tables and lists in memory.

**Indirect Addressing:** Referring to a variable which actually contains the address of another variable.

**Input:** To get data into the computer.

**Instruction:** A step the computer can perform.

**Integer:** A whole number.

**Intermediate Code:** A special kind of object code which cannot be run directly on the computer, but must be interpreted.

**Interpreter:** A program which examines source code a line at a time, decides what it means, and then does it. Compare with compiler.

**Interrupt:** To electronically drag the computer away from what it is doing in order to respond to some time-critical situation.

**I/O:** Input/Output.

**Jump Instruction:** Normally, control proceeds from one instruction to the next, one after the other. A jump instruction passes control, not to the following instruction, but to some other. Jumps can be conditional.

**Kilo-**: Prefix meaning one thousand.

**Kilobyte:** 1024 bytes (Kbyte).

**Kilobaud:** 1000 baud (kbaud).

**Label:** A word which identifies the destination of a call or jump instruction, or simply identifies some location in memory.

**Language:** The set of instructions, and rules for stringing them together, which you use to instruct the computer what to do.

**Library:** A set of programs, or sub-programs.

**Line Number:** A number at the beginning of a line, which identifies it in a similar way to a label.

**Line Printer:** A high-speed printer for computer output.

**Link:** Part of a data item in a list, which tells the computer the location of the next data item.

**LISP:** A list processing language, much favoured by the artificial intelligence community.

**List:** A sequence of consecutive data items.

**Load:** To transfer some data or program into the computer memory.

**Locate:** To "fix" a relocatable code so that it will only run if loaded in a particular location.

**Logical Device:** A device as the computer "sees" it: what the computer regards as the "list device" may be one of several "physical devices", such as a line printer or teletype.

**Loop:** To repeatedly execute a sequence of instructions; part of a computer program that is so executed.

**Machine Language:** The binary codes the machine actually executes.

**Macro:** A user-defined sequence of instructions which can be inserted anywhere in a program.

**Macroassembler:** An assembler which can utilise macros.

**MBASIC:** Microsoft BASIC; the BASIC used in the TRS-80, PET, Apple 11 and so on.

**Memory:** Where the computer stores data and programs internally for fast access.

**Menu:** A display which offers the operator a choice of several alternatives.

**Microcomputer:** A small computer based on a microprocessor.

# glossary

**Microprocessor:** The central processing unit of a computer, built into a single silicon chip.

**Mini-diskette:** A 5½ inch floppy disk.

**MP/M:** A multi-user version of CP/M.

**NAD:** A name and address file maintenance program.

**Numerical analysis:** The art and science of number crunching.

**Object Code:** Machine code.

**Object File:** A file containing object code.

**Object Module:** An object file containing part of a program, ready to be linked to others.

**Octal:** the system of counting to base eight, or grouping bits in threes.

**Offset:** To load an object file somewhere it will not run, in order to edit or modify it.

**Open:** To give the operating system the characteristics of a file so that it can subsequently read or write it.

**Operand:** The number an operator (+, -, etc) operates on.

all work. See Disk Operating System.

**Operator:** An arithmetic function or some other function which alters variables.

**Optimization:** Making a program work better (or faster, or using less memory).

**Output:** What the systems produces.

**Packed Data:** Data which shares the same address, and has to be unpacked before use.

**Page:** A length of memory, typically 256 bytes.

**Parameter:** A constant which sometimes has to be varied.

**Parity:** An extra bit on the end of a character or byte for error detection.

**Pascal:** A modern structured language which may eventually rival BASIC in popularity.

**Password:** A secret word the system may demand of you before allowing you access to certain (or all) programs or data.

**Patch:** A temporary (ha,ha) fix on a bug.

**Peripheral:** A piece of equipment the computer uses, like a printer, disk drive, or modem.

**Peripheral Driver:** A program which outputs data to a peripheral and controls it.

**Physical Device:** See Logical Device.

**PIP:** Peripheral Interchange Program. A CP/M utility for copying files between devices.

**PL.1:** Programming Language /1. A good general purpose commercial language.

**Pointer:** A variable used for indirect addressing.

**Polish Notation:** A method of separating operators and operands; e.g. + 5 4 is Polish Notation for 4 + 5.

**Poll:** To ask a peripheral if it requires service.

**Postfix Notation:** Also known as Reverse Polish Notation, this is similar to Polish; 4 5 means 4 + 5.

**Preprocessor:** A program which does part of a job to make life easier for the program which follows; e.g. a macro processor before an assembler.

**Printer:** Gets computer output down onto paper.

**Priority:** The resolution of which interrupt is serviced first if two should arrive at the same time.

**Process:** A program.

**Program:** A sequence of instructions which can be understood, and ultimately followed, by a computer.

**Prompt:** A message asking the operator to supply information.

**Queue:** A list in which entries are made at one end, and removed from the other.

**R/O:** Read Only; cannot be overwritten.

**RAM:** Random Access Memory.

**Random Access Memory:** The computer's internal memory which is used to hold running programs and data. The computer can both write and read RAM.

**Read Only Memory:** Memory used to store programs, which can not be erased or overwritten.

**Reader:** Paper tape input device.

**Read/Write Head:** The small coil which reads and writes on the surface of a disk.

**Reconfigure:** To reorganise the I/O or other aspects of a system.

**Record:** A set of related data items. For example, an employee's name, address, payroll number and pay rate would form a record.

**Recursion:** The ability of functions in some languages to call themselves.

**Redundant:** Not needed or taken for granted.

**Reentrant Code:** Code which can be used by several programs simultaneously, keeping separate data for each.

**Register:** A location in the processor capable of performing logical or arithmetic functions on the contents.

**Relocatable:** Capable of being moved in memory.

**Relocatable Object Module:** Part of a larger program consisting of many such modules, all linked together and located.

**Resident:** Permanently in the system.

**Reverse Polish Notation:** See Postfix.

**RPN:** See Reverse Polish Notation.

**Run:** To execute a program.

**Save:** To store a program on disk or cassette (particularly BASIC).

**Schedule:** To decide at what stage a process should run (of an operating system).

**Screen:** See CRT.

**Sector:** A section of data on a disk.

**Simulation:** Making one system behave like another.

**Software:** Programs.

**Source Code:** The original text form of a program.

**Source File:** A file of source code.

**Source Language:** The language the source code is written in, e.g. BASIC, Assembler, C.

**Sort:** To arrange items of data in order.

**Spool:** To output a file to a peripheral, usually either a printer or tape.

**Stack:** A list in which both entries and removals are made at the same end. A microprocessor usually has a hardware stack which is used to save subroutine return addresses, temporary storage of data, and to pass variables between subroutines.

**String:** A sequence of characters.

**Submit:** To put the system under control of a file of system commands.

**Subroutine:** Part of a program which can be accessed from several points within the program.

**Symbol:** The name of a variable or a location in memory.

**Symbol Table:** A table constructed by an assembler or compiler to give the addresses of all variables and labels in a program.

**Symbolic Name:** A label.

**System:** A collection of hardware and software, possessed of the property that the whole is greater than the sum of the parts.

**System disk:** A disk carrying the operating system.

**Teletype:** An electro-mechanical printer-keyboard.

**Timeshare:** Running several programs on a system simultaneously.

**Track:** The area under the read/write head during one rotation of a disk.

**Transfer:** To move data.

**Transient:** A program that is only in memory for a short time before being overwritten. Often, the only program that is not a transient is the operating system.

**Tree:** A list in which each data item may refer to several others.

**TTY:** See Teletype.

**Unix:** A multi-user, multi-tasking, multi-programming operating system, expected to appear on microcomputers before long.

**User:** One of the people connected to the computer.

**Utility:** A program of use to most users.

**Variable:** Named quantity that can take on different values.

**Verify:** To check that data written on a disk or tape can be read again correctly.

**Warm boot:** To reload the operating system a second or subsequent time.

**Word:** The amount of data fetched from one memory location. Typically one byte, but can be two on recent processors.

**Word Processor:** A system for manipulating, editing, printing and formatting texts files.

**WordStar:** A proprietary word processing program.

**Write Protect:** To remove the cover from the notch in a floppy disk so that it cannot be written on.

**Zilog:** Manufacturer of the Z-80 and Z8000 microprocessors.

**Z80:** A popular 8-bit microprocessor.

# market directory

## SOFTWARE FOR THE MICROBEE

Design your own data systems

16K DATMAN Version 1.00

A Data Manager which works on all MICROBEE computers with a cassette recorder. Features KEYED files, and facilities to allow users to add their own programming. MENU operated, allows data storage and retrieval via the cassette

\$59.95 (inc tax) for the program and comprehensive instruction manual.

**IWB Micro Data Systems**  
'Glenoe', Windermere Rd, Lara Vic 3212  
Dealer enquiries invited

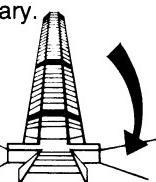
## the Computer Spot

### WANTED

Full-time or part-time employee.  
Sales experience necessary.  
Age 19-25.  
Salary negotiable.

SHOP C4, MLC CENTRE  
MARTIN PLACE, SYDNEY

PHONE: (02) 235 2971



### AGENT

required to distribute our products in NEW ZEALAND.

MUST BE ZX81 USER

See our advertisement on page 91.

### G. S. WEBBER & ASSOCIATES

"A WORLD OF SOFTWARE"  
P.O. Box 238  
Gymea 2227

SORCERER SOFTWARE AVAILABLE  
10% DISCOUNT DURING OCT

FOR FREE CATALOGUE  
PLEASE CONTACT

AURORA SEC. ENTERPRISES

P O BOX 80  
VILLAWOOD 2163  
(02) 726.5948

**ANCHOR-STAT 1150 X 1350 mm COMPUTER CHAIRMAT for STATIC-CONTROL, COMFORT and EFFICIENCY**

Simply place the ANCHOR-STAT mat under your chair for PRICES, BROCHURES & DETAILS

**SYDNEY (02) 683 3469  
MELBOURNE (03) 720 1277**

**HERITAGE TRADING COMPANY**  
7 Gibbons Street  
Carlingford NSW 2118

**ROCKSOFT SOFTWARE ZX81**

**FUNPAC 1** 3 SUPER COLLECTIONS OF POPULAR GAMES.  
5 GAMES - 1K INCLUDES: POKIES, GOLF, INVADERS, CASINO.

**FUNPAC 2** 5 GAMES - 1K  
**FUNPAC 3** 3 GAMES - 16K \$9.99 EACH

ALSO

**SCRAMBLE** THESE ARCADE GAMES ARE ALL WRITTEN IN MACHINE CODE GIVING VERY FAST MOVING GRAPHICS AND A COMPLEXITY NOT AVAILABLE WITH BASIC PROGRAMS

**ASTEROIDS** ZX 81+ 16K  
**INVADERS** ZX 81+ 16K  
**DEFENDER** \$14.99 EACH  
8K ROM + 16K

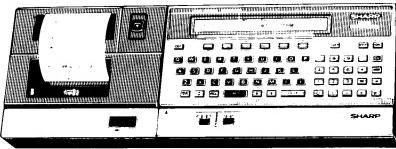
PRICES INCLUDE POST & PACKAGE  
BANKCARD WELCOME  
SAE FOR CATALOGUE

**ROCKSOFT**

G.P.O. BOX 5194 AA, MELBOURNE 3001.  
PHONE ORDERS (03) 729 9647



Sharp business computers. Let the name you know pave your way.



**SHARP PC 1500 PORTABLE COMPUTER**

- Rechargeable battery or mains operation with powerful 8 bit processor.
- Optional 4 colour graphic printer and double cassette player connection.
- Easy to understand BASIC language booklet.
- Protective carry case. See Sharp ad page 27.

COMPUTER SYSTEM SPECIALISTS  
**Computer Focus**

4/224 George Street, Liverpool (02) 600 8222



## the Computer Spot

FOR .....

BLANK DISKS, BOOKS & SOFTWARE

WE'RE SO SOFT WE DON'T EVEN CHANGE THE LIGHT GLOBES AT THE OFFICE !!!

WRITE FOR OUR CATALOGUE !

BOX 233, WOOLLAHRA, N.S.W. 2025.

Sydney's only store devoted to computer supplies

NOW STOCKING

**NEC PC-8000**

MICRO COMPUTER  
Call in for demonstration

**Office Updates**

45 ERSKINE ST., SYDNEY Telephone: 29 1991

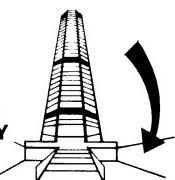
**the Computer Spot**

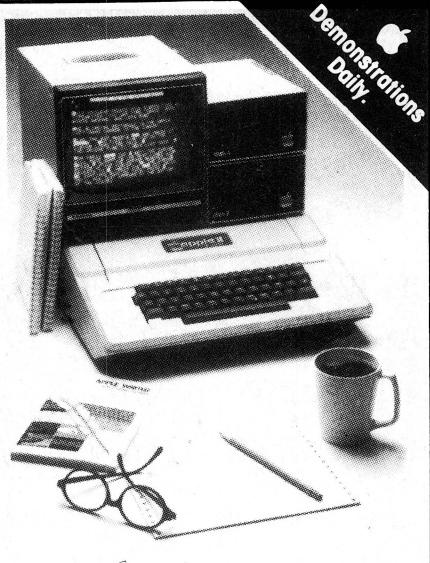
**BUY - SELL - TRADE  
YOUR COMPUTER NOW**

Call in or phone  
for a special deal

SHOP C4, MLC CENTRE  
MARTIN PLACE, SYDNEY

PHONE: (02) 235 2971





## Word Processors from \$4,500 to \$9,000

(Inc. S. Tax)

Professionals buy their Word Processor/Computers from **COMPUTER GALERIE** because Computer Galerie

- know their software
- with detailed knowledge of Debtors/GL Systems to 900 clients
- know Word Processing
- with 6 years office management and stationery back up.

### STOP PRESS:

#### apple gx

##### NEW RELEASE OFFICE QUALITY COMPUTER

The GX is a superior value office word processor incorporating Multiplan financial modelling. The extra feature is full electronic mailing. This package has 76k (192k optional).

ANY OTHER SYSTEM IS A  
COMPROMISE.



call David Diprose  
BUSINESS DIVISION  
**COMPUTER GALERIE**  
66 Walker Street  
NORTH SYDNEY 929 5497

# your computer services

**LETTERS TO THE EDITOR:** We are happy to receive your comments and, if they are of interest to other readers, publish them. Letters will only be considered for publication if they include your name and address, although we can withhold such details from publishing on request. Note that we reserve the right to (and probably will) edit all letters for the sake of brevity, clarity or accuracy.\*

**SUBSCRIPTIONS:** Standard rate within Australia, \$24; airmail \$35. Available free with membership to the Mi-Computer Club (club membership fee, \$24). NZ: Surface mail \$A30; airmail \$A40. Allow up to eight weeks for subscription processing.

**BACK COPIES:** and single issues are available from the publisher's office (\$2) or by mail (\$2.50).

**READERS ENQUIRIES:** We will make every effort to answer readers' written enquiries if accompanied by a stamped, self-addressed envelope, although staff shortages and deadline pressures may cause delays. Please include your telephone number(s) with any enquiry. Phone enquiries not related to subscriptions, readers' advertisements, or other 'service information' cannot be accepted.

**COPYRIGHT:** All material appearing in *Your Computer* magazine is copyright and cannot be reproduced in part or in full, by any means, without the written permission of the Publisher or Managing Editor. Computer clubs and schools can, however, apply for restricted permanent reproduction rights for non-commercial, limited-circulation use (e.g. newsletters and class instruction).

**LIABILITY:** Although it is policy to check all material used in *Your Computer* for accuracy, usefulness and suitability, no warranty, either expressed or implied, is offered for any losses due to the use of any material in this magazine.

**EDITORIAL CONTRIBUTIONS:** Contributions to *Your Computer* are welcomed and will be given every consideration\*. Please read these notes carefully to get an idea of the style and format we prefer.

**All Contributions:** should include your name, address, and home and office phone numbers (in case we need to check details).

**Contributions on disk:** Contributions can be accepted on 20 cm standard CP/M disks or on 13 cm Apple DOS or Apple CP/M disks. Please pack them extremely carefully if posting, and label all disks with your name, address and phone number.

**Style:** All items should be typed (or printed) and double-spaced on white paper. Include your name, address, telephone number and the date on the first page of your manuscript (all manuscript pages should have your surname and page number in the top right-hand corner). Be clear and concise, and keep jargon and adjectives to a minimum.

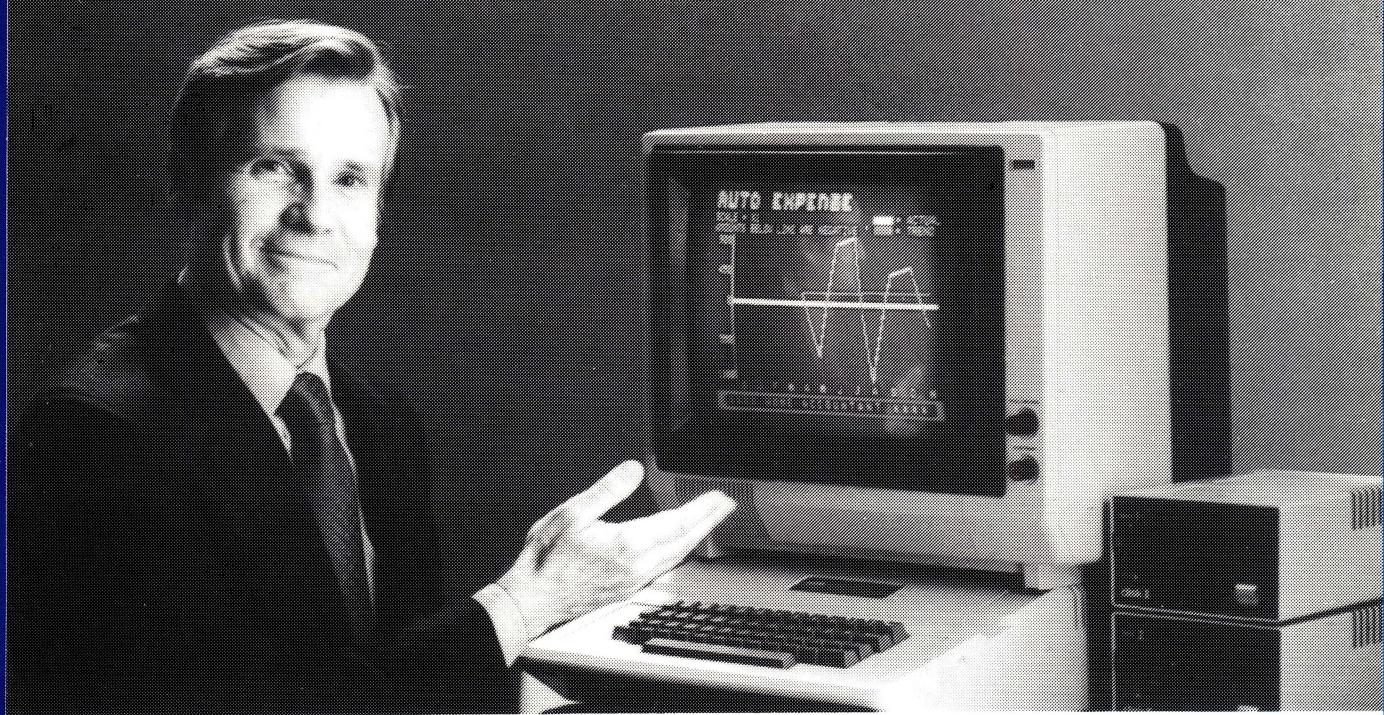
**Listings:** Unless it is absolutely impossible, we want listings produced on the computer. This reduces the risk of error — if the computer typed it, the computer probably accepted it. Print listings with a dark ribbon on white paper. If they can't be produced on a printer, borrow a

typewriter — hand-written material is likely to sit around the office for a year before someone can find time to type it all out for you! Please provide an account of what the program does, how it works and so on. Any comments on the program should refer to the address, line number or label rather than to a page number. Any comments on modifying the program to work on other machines will be appreciated. Try to include a printout of at least part of a sample run if possible.

\*Although the greatest care will be exercised with contributions, no responsibility can be accepted for the safety or return of any letters, manuscripts, photographs or other materials supplied to *Your Computer* magazine. If return is desired, you should include a stamped, self-addressed envelope.

### advertisers index

|                                     |            |
|-------------------------------------|------------|
| AED .....                           | 12         |
| Archive Computers Brisbane .....    | 64         |
| Bernak .....                        | 77         |
| Cameo .....                         | 90         |
| Case .....                          | 43         |
| City Personal Computers .....       | 5, 88      |
| Classifieds .....                   | 89         |
| Commodore Information Centre ..     | 18, 49     |
| Computer Focus .....                | 77         |
| Computer Galerie .....              | 98         |
| Computer Spot .....                 | 7          |
| Computermax .....                   | 29         |
| CPU Applications .....              | 91         |
| Cosmic Software .....               | 93         |
| Customized Technology .....         | 80         |
| Cybernetics Research .....          | 33, 37, 74 |
| Datron .....                        | 63         |
| Dicker Data .....                   | 47         |
| Digidard .....                      | 81         |
| Dick Smith Electronics .....        | 50         |
| Futuretronics .....                 | 34         |
| Gammon & Gobett .....               | 71         |
| Hitachi .....                       | .IFC       |
| Ilehead .....                       | 10, 14     |
| Imagineering .....                  | .IBC       |
| Information Pathway .....           | 82         |
| Lothlorien Farming .....            | 16         |
| Magmedia .....                      | 8          |
| Market Directory .....              | 97         |
| Mi Computer Club .....              | 72         |
| Micro 80 .....                      | 39, 41     |
| Microvisions .....                  | 79         |
| NECISA .....                        | 57, OBC    |
| New Generation Computer Store ..... | 55         |
| Padmede Commercial Systems .....    | 69         |
| President Office Machines .....     | 15, 17     |
| Ribbons Galore .....                | 71         |
| SCOLA .....                         | 90         |
| Seahorse Computer's .....           | 56         |
| Sharp .....                         | 27         |
| Sigma Data .....                    | 67, 68     |
| Software Source .....               | 38         |
| Vic Soft .....                      | 58         |
| Vision-80 .....                     | 11, 13, 56 |
| Webber & Associates .....           | 91         |
| Wildcat .....                       | 20         |



## CONTINENTAL'S HOME ACCOUNTANT IS NUMBER ONE— AND CLIMBING.

For the past several months, Softalk magazine has rated Continental Software's Home Accountant<sup>TM</sup> No. 1 in its "Home 10" best-seller list.

A lot of programs would have "peaked" by now. But with over 10,000 copies in use, Home Accountant just keeps getting stronger.

There's a reason for this spectacular success—and it's not just the low suggested price of \$94.95.

The fact is, Home Accountant is one of those rare programs that virtually everybody can profit from using. It's powerful enough to handle even the most complicated family budget—yet it's so

easy to use that one quick trip through the manual may be all you'll ever need.

With Home Accountant you can track up to 100 budget categories, 5 different checking accounts, and all the credit cards you can carry. Just press a few keys and watch the program print your checks, net worth and other financial statements. And when you see the full-color graphs of actual vs budgeted expenses, trend line analyses, etc., you'll know you bought the best.

See your Apple dealer soon for a demonstration. And start watching your fortunes climb with Home Accountant.



distributed by

**IMAGINEERING**

Available from your local micro computer dealer.

22-40 Sir John Young Cres., Woolloomooloo Sydney, NSW 2001, (02) 358 3011

**A successful sandwich shop means more than cutting great sandwiches. It means cutting costs to the bone without cutting corners.**

The NEC PC8000 personal computer makes it possible for the small businessman with no computer training, to analyse his business in every aspect.

This will almost certainly produce ideas as to how to make the business more efficient and profitable.

The NEC PC8000 personal computer has many kinds of application programs available.

You can get them from the store at which you buy your machine. With these you can do anything from basic book-

keeping to producing financial forecasts and trend analysis of your business.

The NEC PC8000 personal computer is designed and manufactured by NEC in Japan, where 10,000 a month are being manufactured and sold worldwide.

★★★★★

Application programs available include:-

2 Word Processors, Mailing List, Telecommunications, Target Business Planner, Debtors, Creditors, General Ledger, Inventory, Invoicing, Program Generator, Dbase II, Micro Modeller.

**NEC**  
TOKYO JAPAN  
**PC 8000 series**

**"WHEN IT COMES TO CUTTING COSTS THIS COMPUTER IS AS KEEN AS HIS FAVOURITE KNIFE."**

